Textile World

The World's Textile Authority

INDEX

To VOLUME 85

January to December, 1935

BRAGDON, LORD & NAGLE COMPANY

Division of McGraw-Hill Publishing Co., Inc.

330 West 42nd St., New York

General Alphabetical Index

PAGES BY ISSUES

January 47-114
February 223-290
February 28 415-488
March 635-704
April 847-916
May 1051-1120
June 1247-1316
July 1441-1506
August 1619-1686
September 1817-1888
October 2025-2092
November 2225-2292
December 2429-2496

A

Accounting—Record keeping of experimental fabrics. E. P. Howard.....1863
Acoustical properties of textiles. R. G. Silbar 1630
Agricultural Adjustment Administration—AAA steals the show. D. G. Woolf..1624

Air Conditioning

Refrigeration applied to removal of raw wool impurities. E. H. Barker.....1085
Smoke and fog in finishing plant eliminated by hoods and fans. Miles Sampson 2447
Woolen company adds humidification system in continuous modernization program. F. A. Westbrook.....2253
American Association of Textile Chemists & Colorists—New York meeting.... 70
American Cotton Manufacturers Assn.—Report of Augusta meeting 1069
American Society for Testing Materials—Committee D-13 meets 2244
D-13 Committee busy with wool standards 1256
D-13 Committee applaud "S" and "Z" at Providence meeting 891
American Society of Mechanical Engineers—Textile division meeting at Greenville 1076
Asbestos—preventing cards from rocking.2269

Associations

Coordinated trade, for the textile industry. Peter Van Horn 53
Whither the trade association? F. E. Slack 2258
Canadian Primary Textiles Institutes coordinates association activity..... 852

B

Bleaching

Bleach-house efficiency by revamping equipment. Miles Sampson 862
Bleach-house efficiency gained by machinery layout. Miles Sampson..... 664
Bleach-house rolls, taking care of. Miles Sampson 1293
History of processing and the year 1785. Woolf & Chase 1265
Loss in weight in bleaching knit goods.1866
Practical helps for overseers..... 482
Year's technical developments..... 480
Book reviews—Union management cooperation in the stretch out. R. C. Nyman. 97
Braider flexibility. E. J. Gibbons.....1642
Brazil—Brazilian cotton could reach par with U. S. C. L. Jones 2035

C

Canada—Canadian journey—notes from editor's diary 1626
Modernizing cotton manufacturing equipment 1821

Carpets and Rugs

Acoustical properties of textiles. R. G. Silbar 130
Dry marks on carpet 682
Institute plans to improve carpet position 1862
Through-the-back rugs. C. F. Harleston.1258
Cellophane. See Cellulose film, split.

Cellulose Film, Slit

Bathing suits 2241
Cellophane warp 92
French novelties for spring 233
Pedaline braid 2270
Tinsel fabrics. B. D. Blackman..... 81

Codes

Cotton code operation 444
Finishing code operation 480
Knit goods code operation 473
Knitted Outerwear Code Authority enlarges offices 258
Man in the mill vital factor in code conformance, S.T.A. members are told..1460
Rayon code operation 460
Records of code hearings should be preserved (ed) 850
Silk code operation 466
Textile codes remain efficient despite U.T.W. attack 423
Wage differential (ed) 1054; D. G. Woolf 1057
Wool code operation 453
Color—Gay color in wool goods. M. H. Carothers 2062
Color harmony. Faber Birren 2046
Color in weave. T. R. Hart.....2-59
Continental Committee (ed) 51

Costs

Avenues to saving 426
Cost break-down showing percentage relationship of major items. R. E. Loper (charts) 428
Distributing woolen mill costs. C. W. Bennett 1454
Floor laying methods and materials to cut costs. A. J. Cooper.....1634
Manufacturers can reduce back-door losses by better purchasing. M. M. Abrams 2458
Manville Jenckes saves 355% by installing new equipment 2434
Power costs. R. E. Loper.....2236
Raw material is big item of cost in industrial cottons. R. E. Loper.....1629
Costs. See also articles under other headings.

Cotton

American cotton is not degenerating... 650
Brazilian cotton could reach par with U. S. C. L. Jones 2035
Break in cotton (ed) 638
Colored twist yarns 680
Cotton loan (ed) 1820
Cotton maturity determined by microscope 1475
Export bounty plan (ed) 1055
Staple strength—what staple of cotton to afford a good-running yarn? C. D. Brandt 1833
U. S. domination of world market seen at end 1458
Cotton Manufacturers Assn. — Pinehurst, N. C. meeting 2444
Cotton Manufacturers Assn. of Georgia—Report of "Golden Isles" meeting..1255

Cotton Manufacturing

AAA amendments (ed) 1444
A.C.M.A. meet at Augusta, Ga.....1069
A.S.T.M. annual report 1469
Avondale Mills makes moving picture..2445
Bags, cotton 1867
Bathing suit of waterproofed cotton lawn 2241
Bounty plan to help regain world markets. F. W. Jefferson 853
Boys' cotton-mix suitings. J. M. Masson.2457
Braids, manufacture of 269
Broken picks and bobbin break-outs avoided by cotton loomfixers. Ivar Moberg 2448
Bunches in cotton yarn. C. A. Weston. 80
Cabinet committee's recommendations on cotton textiles 1824
Cabinet committee's report (ed).....1820
Chambray pitfalls. George Fuller.....1632
Chambray with spotty filling 1295
Chart for cotton-roving twist. T. W. Lawton 2045
Clip marks on cotton fabric. F. W. Berwick 681
Cloth room overseer. G. G. Nicholson. 76
Coale operation 444
College style show cottons. T. R. Hart 857
Color in weave. T. R. Hart.....2059
Colored oil places the responsibility for stains 1834
Copper tinsel for pot scourers and decorative tinsel 57
Cost break down in percentages. R. E. Loper (charts) 428
Cotton and cotton textile prices and activity 444
Courtaulds spins staple rayon yarn on cotton machinery 238
Crepes — manufacturer and finisher should pool their information. C. A. Jennings 662
Crepons, vat dyeing of. A. J. Hall....1640
Diversification solves merchandising problems for cotton mills. Mildred Barnwell 647
Detergents, new. David McGill.....1270
Draperies shrink 2271
Dyeing cotton-acetate mixers with aniline black. A. J. Hall..... 254
Dyeing cotton jersey with vat colors.. 894
Dyeing even shades on raw stock. G. I. Putnam 1097
Dyeing knit goods. E. F. Cleveland.... 242
Exports to be boosted by subsidy plan.2242
Fastener tape, weaving..... 93
Fiber-bond finish 1457
Flake and nep yarn 682
Fluorescence analysis. K. M. Herstein..1274
Frieze mottled 93
Fused collar. A. A. Wynn.....1059
Georgia executives discuss gyrators to drafts at meeting 890
Happy days coming for cotton textile industry. J. D. Hannett 2032
High lights of the year 443
History of processing and the year 1785. Woolf & Chase 1265
Honeycomb pile fabric. G. R. Robertshaw 2050
Honeycomb weaves. T. R. Hart..... 248
James Gibson (ed) 1055
Japan exports to U. S. six times 1934 rate 1631
Japan gains foothold in domestic cotton goods market 652
Japan makes huge economies in U.S. cotton industry 54
Japanese competition. D. G. Woolf....1057
Japanese efficiency in mergers and in output-per-worker. Burgess, Norton....2034
Japanese menace (ed) 1054
Japan's cotton mill modernization.....2240
Lace of 3-fibers dyed. L. A. Jordan..2460
Lancashire, England, plan for scrapping spindles 1628
Lancashire, England, reports machinery scrapping plan. J. G. Oliver..... 55
Leno ends bunched 1866
Loop effect on cotton fabric..... 894
Manufacturer, converter, finisher must cooperate for profit. C. A. Amick....1062
Marking roving bobbins. F. L. Byrd.. 267
Matelasse's ramifications. C. S. Jennings 65
Mercerized yarn lacks luster 1866
Merlin fabrics consist of cotton and bast fibers combined. J. G. Oliver.....1639
Mill store. M. A. Potwin 250
Mill testing discussed by Eastern Carolina Division of S.T.A.....2462
National cotton week 1073
Nets, laundry and dye 1664
New rôles for old fibers for 1936.....2436
1935 fabrics 433
Novelty yarn contraction 92
Opinions from industry 442
Pick wheel take up 92
Pile fabrics waterproofed 93
Plush, lessening grease spots in.....2069
Powder puff industry 2270
Practical helps for overseers..... 448
Pressed-felt finishing. F. A. Hayes....1650
Processing research. W. M. Scott.....1268
Processing tax (ed) 1622
Processing taxes—to sue or not to sue?.1446
Raw material is the big item of cost in industrial cottons. R. E. Loper.....1629
Report of the Bureau of Labor Statistics (ed) 226
Research program under federal and state coordination. H. W. Barre....2246
Revolving ring—first variable-speed ring spinning 253
Ring-frame production 656
Roads of cotton 2031-2233
Roll covering discussed by South Carolina spinners 1264
Roll spacing is key setting of cotton card and spinning rooms. K. B. Cook. 651
Roughness in new French weaves. Mildred Barnwell 59
"S" and "Z" twist terms now standards—A.S.T.M. meeting 1469
S.T.A. discusses spinning at Greenville, S. C. 2255
S.T.A. Eastern Carolina Division meets at Raleigh, N. C. 1084
S.T.A. meeting at Gibsonville, N. C....1483
S.T.A. meets at Myrtle Beach, S. C...1460
Sanforizing for five years shows aggressive merchandising 1272
Seersuckers, avoiding knots and loose ends. Thomas Nelson 1831
Shirt fabrics—fancy weaves and woven colors 669
Shirtings, printed. A. A. Wynn..... 1281
Slack patterns in cottons for 1936....2259
Slashing and weaving discussed at Atlanta meeting of Textile Operating Executives 2054
Soaping cotton prints. F. L. Taylor...2440
Spinning cotton to the cut system on the woolen principle 1098
Spring designs. C. C. Mattmann, Jr....1851
Stratosphere balloon shows importance of cotton fabrics 2444
Suede, artificial 240
Suitings for summer. W. L. Carmichael 243
Survey of economic status 443
Ten years of cotton textiles (table)... 650
30-hour week and its effect on the small mill 61
Thread, splicing sewing 1295
Thread, yarn sizes for 2070
Tinsel fabrics. B. D. Blackman..... 81
Total reported investment, income and rates of return of 765 companies in the textile business 62
Twist take-up 1867
Twist variations 268
Two hundred weavers cross examined at S.T.A. meeting at Spartanburg..... 646
Uneven picker laps, ask 17 questions if you have. C. A. Weston 2451
Velour finishing. G. L. Atkinson.....2450
Wage report on cotton textiles 1933-1934 231
Warp contraction, calculating.....683, 1294
Warp contraction, calculating. R. A. C. Scott 2071
Yarn uneven 2475

670.5
V.85

Year's technical developments 446
Cotton Textile Institute—Annual meeting in New York 2232
Murchison, new head 2231
Representatives who attended White Sulphur meeting 50
Cotton Textile Work Assignment Board—Report recommends permanent tribunal for work assignment problems 1054
Crepes and crepage—Warp preparation and weaving important 1844
Finisher's control of pebble and take-up.1845
Determination of crepage in yarns and fabrics. I. J. Saxl.....1846

D

Design

Bathing charms 2241
Boys' cotton-mix suitings. J. M. Masson.2457
Camp blankets. H. P. Galloway..... 661
Color harmony. Faber Birren.....2046
Color in weave. T. R. Hart 2059
Color in wool goods. M. H. Carothers.2062
Cotton summer suitings. W. L. Carmichael 243
Cottons for 1936 slacks 2259
Cottons selected for college style show. T. R. Hart 857
Crepes — manufacturer and finisher should pool their information. C. A. Jennings 662
Diversification solves merchandising problems for cotton mills. Mildred Barnwell 647
Double cloth cut effects. R. A. C. Scott 2049
Double cloths. R. A. C. Scott..... 72
Double shot fabrics 1098
Embossed velvet. Howard Lyman.....1254
Fabrics for 1935 433
Fabric's the thing—Paris sets keynote. Betty Hirschberg 1451
Fashion futures. E. L. Fetta 2033
French novelties for spring 233
Guatemalan costumes inspire designs... 660
Half hose parade. R. J. Frost..... 870
Honeycomb pile fabric. G. R. Robertshaw.2050
Honeycomb weaves. T. R. Hart..... 248
Knit designs, calculating presser diameters for. J. F. Cahill 236
Knit outerwear now enjoying prosperity. 874
Latch-needle design. J. F. Cahill.....2052
New rôles for old fibers for 1936.....2463
Normandie's fabric fashions.....1646
Novelty yarns. M. G. Barnwell.....1450
Old paintings inspired current Parisian styles. B. E. Hirschberg 2037
Printed shirtings. A. A. Wynn.....1280
Record keeping of experimental fabrics. E. P. Howard 1863
Rib-knit fabric face. J. F. Cahill.....2250
Roughness in new French weaves. Mildred Barnwell 59
Rugs, through-the-back. C. F. Harleston.1258
Satin designs. C. C. Mattmann, Jr...1257
Shantungs, cloques, openworks for Spring. C. C. Mattmann, Jr.....1851
Shirt fabrics—fancy weaves and woven colors 669
Silk design winners in students' contest.2489
Tinsel fabrics. B. D. Blackman..... 81
Underwear, brief 1284

Dyeing

Acetate, streaks in 894
Analyzing fiber mixes 2271
Aniline black prints. F. A. Newton....2256
Boucle yarn dyes unevenly.....2070
Bright shades without using basic dyes. F. W. Berwick 1293
Cleaning dye tubs 2271
Cotton-acetate mixers dyed with aniline black. A. J. Hall 254
Cotton dyed on even shade on raw stock. G. I. Putnam 1097
Cotton jersey dyeing with vat colors... 894
Crepons, vat dyeing of. A. J. Hall.....1640
Cuprammonium hosiery dyeing. W. H. Hand 1644
Dyeing properties discussed at A.A.T.C.C. meeting 71
High-lights of the year..... 479
History of processing and the year 1785. Woolf & Chase 1265
Hosiery dye not fast 894
Hosiery dyeing 895
Hosiery, spotted, due to sensitive dye avoided by simple test. Harry White..1465
Hot-water supply for dyeing machines. F. B. Wick 81
Knitted fabrics, dyeing 268
Lace of 3-fibers dyed. L. A. Jordan....2460
Matches in knit goods dyeing. E. F. Cleveland 242
Pad dyeing faults. F. A. Newton.....1860
Practical helps for overseers 482
Rayon dyes 1278
Scum on water. G. L. Putnam.....1293
Silk fabric has drag marks.....1665
Single bath hosiery dyeing with sulphon cyanine black B. W. H. Hand..... 880
Soaping cotton prints. F. L. Taylor....2440
Sorting apparatus for drying machines.1865
Survey of economic status..... 479
Testing dyes for hosiery. Harry White 244
Unevenness in silk yarn 682
Viscose-acetate milanese dyeing. L. A. Jordan 1093
Year's technical developments 480

E

Engineering

A.S.M.E. textile division discusses mill engineering 1077
Bleach-house efficiency by revamping equipment. Miles Sampson 862
Bleach-house efficiency gained by machinery layout. Miles Sampson.... 664
Boiler room efficiency. R. L. Rowan...2056
Bulletin reminds overseer of possible economies 668
Buy coal on basis of heat units per dollar. N. T. Pef 889
By-product power. H. E. Corl.....1861
Coal, steam, and drives discussed by Master Mechanics at S.T.A. meeting..2058
Colored oil places the responsibility for stains 1834
Combustion-control instruments prevent fuel waste. H. E. Corl 252
Cooling condensing water equipment. C. L. Hubbard 78
Diesel engine as source of supplementary power. C. L. Hubbard 1470
Equipment at Greenville and Philadelphia shows 1082
Fire hazard. P. R. Lowe..... 246
Floor laying. A. J. Cooper.....1634
Grabur plant exemplifies latest silk throwing trend. C. W. Bendigo.....1463
Hoods and fans improve ventilation of finishing plant. Miles Sampson.....2447
Hot-water supply for dyeing machines. F. B. Wick 681
Operating and efficiency engineers needed in power plant. N. T. Pef 2471
Piping practice—installation and replacement methods 1474
Preventive maintenance. H. H. Iler.... 488
Single boiler operates entire plant of Norwich Knitting Co. Waldo Hutchinson 77
Southern Textile Exposition exhibits new weaving equipment 1078
Trade-waste disposal 1276
Variable speed drives applied to ring spinning and twisting. W. I. Bendz.. 858
Ventilation of finishing plants with correct hoods and fans. Miles Sampson.1648
Year's technical developments..... 484

Exhibitions

Fashion Groups "Perfect wardrobe." E. L. Fetta 2033
Knitting Arts Exhibition at Philadelphia 1080
Knitting Exhibitions, Philadelphia—Textile World Guide 865
Knitwear Industrial Exposition..... 678
Outerwear week 257
"Silk Review" 856
Southern Textile Exposition.....1078
Textile World's guide to Southern Textile Show 640
Exports and imports — Foreign trade shrinks, 1923-1934 431

F

Federal Trade Commission—Textile earnings' rise and fall in report..... 62

Finishing

Bathing suit of waterproofed cotton lawn 2241
Camel's hair cloth finishing. J. M. Masson 2069
Circular knit goods finishing.....2473
Code operation 480
Crepe, flat, should not have too much sheen. Philip Lebrun 2048
Crepes and their finishing. C. A. Jennings 662
Crossbreds, harshness of, can be overcome in finishing. G. L. Atkinson....1468
Desizing agents 2055
Fiber-bond finish 1457
High lights of the year 479
History of processing and the year 1785. Woolf & Chase 1265
Jersey cloth finishing. Chagnon & Galloway 878
Latex application. J. F. Hotchkiss.... 666
Manufacturer, converter, finisher must cooperate for profit in cotton industry. C. A. Amick 1062
Matelasse's ramifications. C. S. Jennings 65
Men's wear suitings, finishing, requires care. G. L. Atkinson 75
Mercerized yarn lacks luster.....1866
Mineral oil in finishing. D. W. Welsh..2044
Opinions from industry 478
pH control, value of. F. R. Harrison..1859
Polishing cord 1664
Practical helps for overseers..... 482
Pressed-felt finishing. F. A. Hayes....1650
Rayon crepe appearance depends on thrower's soaking. C. W. Bendigo.. 864
Rayon sizing compounds. Genstein & Newman 1095
Sanforizing for five years shows progressive merchandising 1274
Selling the finish. John Black.....1280
Sizing compounds for rayon. Genstein & Newman 1093
Survey of economic status 479
Tables for wool finishing machines....1473
Velour finishing. G. L. Atkinson.....2450
Ventilation of finishing plants with correct hoods and fans. Miles Sampson. 1648. 2447
Waste on fabric ends 2269
Waterproofing glazed yarn 1098
Waterproofing pile fabrics 93
Year's technical developments..... 480
Fire protection. P. R. Lowe..... 246

G

Germany — Rayon staple. O. W. Bitzenhofer 2040
Great Britain—Lancashire, England, plan for scrapping spindles 1628
Lancashire, England, reports machinery scrapping plan. J. G. Oliver..... 55

H

Hosiery

Allocation of duties in a hosiery mill. M. M. Abrams 2038
Blotches on hosiery 682
Bobbed hosiery 657
Chiffon hose, holes in 1295
Construction of hosiery 895
Cotton wraps spinning roll.....2270
Creases in hosiery 1484
Damaged on inside 2070
Defect in hosiery 268
Defective hosiery 2271
Defects due to carpet beetle 683
Dye not fast in hosiery 894
Dye testing for hosiery. Harry White.. 244
Dyeing hosiery made from cuprammonium yarns. W. H. Hand 1644
Dyes unevenly 895
Faulty seams 1664
Full-fashioned selvages — knock-over curve. M. C. Miller 1066
Grabur plant exemplifies latest silk throwing trend. C. W. Bendigo 1463
Gray goods protected by hosiery bags. M. M. Abrams 1641
Half hose parade. R. J. Frost 870
Holes in hosiery 894, 2071
Holes in legs 1098
Knee length among recent full-fashioned changes. M. C. Miller 872
Knitting Arts Exhibition at Philadelphia 1080
Knitting Exhibition, Philadelphia—Textile World Guide 865
Latch needle breakage. G. E. Cottrell.. 256
Mildew on hosiery 2475
Manufacturers can reduce back-door losses by better purchasing. M. M. Abrams 2458
N.A.H.M. meet in Philadelphia 1074
Non-run reborn—warp threads employed in full-fashioned hose 69
"Ringless" hose in two tones.....1294
Seamless hints. G. E. Stevens..... 74
Seamless hosiery equipment surveyed... 239
Seamless trends. G. E. Cottrell..... 869
Single-bath hosiery dyeing with sulphon cyanine black B. W. H. Hand..... 880
Sinker-cam adjustment for reduced waste. G. E. Cottrell 2254
Sleazy welt on full-fashioned hose....2474
Soaking for "Ringless." H. C. Roberts.1261
Spiral float for seamless knitting machines. G. E. Cottrell..... 660
Spots on hosiery due to sensitive dye avoided by simple test. Harry White.1465
Spotted hosiery 1866
Stitch distortion in welt 2271
Streaked hosiery 1664
Streaks in hosiery 92
Streaks and two tone in hosiery..... 894
Streaky hosiery 1485
Stripes in hosiery feet 2070
Survey of economic status 471
Thread for seaming 1485
Three-carrier system for ringless hosiery stimulates demand for direct running yarns. D. C. Chamberlin 677
Transfers applied efficiently. G. E. Cottrell 1862
Twist, influence of, on diameter, shortening and dullness of silk hosiery yarn. Seem & Andrew 860
Twist, influence of, on shade and dullness of hosiery yarn. Seem & Andrew.1065
Uneven seam in hosiery 92
Vertical streaks in hose 2270
Washboard and its elimination in 3-carrier hosiery. W. A. Simond.....1462
Washboard in 3-carrier hosiery.....1866
Washboard and zebra 1099
Washboard knitting 682
Welt discolored 1098
White deposit on hosiery 1664
Year's technical developments 474

I

Industries—1935 prospects 52
Institute of Carpet Manufacturers of America—Plans to improve carpet position 1862
Italy—Rayon staple. Vincent de Pascali..2041

J

Japan—Economy in Japan's cotton industry 54
Gains foothold in domestic cotton goods market 652
Japanese efficiency in mergers and in output-per-worker. Burgess, Norton..2034
Sending us cottons at six times 1934 rate 1631
Textile growth 2240

K

Knit Goods

Backing wheel layout 2071
Balbriggan curls after cutting..... 1867
Bare rubber knitted 2461
Bleaching knit goods, loss of weight in..1866
Boucle yarn dyes unevenly..... 2070
Calculating presser diameters for new knit designs. J. F. Cahill 236
Code operation 473
Corsets of today — analysis of three knitted types. J. B. Lancashire..... 876
Cotton jersey dyed with vat colors.... 894
Dyeing knitted fabrics 268
Finishing circular knit goods. E. S. Dunlap 2473
High lights of the industry 471
Home knitting fad aids yarn sales. M. G. Barnwell 1450
Jersey cloth finishing. Chagnon & Galloway 878
Knitting Arts Ehxibition at Philadelphia 1080
Knitting Exhibition, Philadelphia—Textile World Guide 865
Knitwear Industrial Exposition..... 678
Latch needle design. J. F. Cahill..... 2052
Lint on knitting machines 683
Matches in knit goods dyeing. E. F. Cleveland 242
Napping knit goods 92
New roles for old fibers for 1936..... 2463
Opinions from industry 470
Outerwear, knit, now enjoying prosperity 874
Practical helps for overseers..... 476
Rib-knit fabric face. J. F. Cahill.... 2250
Same fabric from different cuts..... 268
Setting spring needle jack pressers.... 893
Shorts for men 877
Survey of economic status 471
Tension problem in underwear mills. L. G. Goldenberg 1637
Unevenness in knit goods 93
Waxing knitting yarn. G. W. Sheeley.. 269
Year's technical developments 474

L

Labor

Anthrax preventable. I. G. Macdonald..2238
Bill for regulation of wages and hours (ed) 1622
Callaway Mills issues "51 questions and answers" 2068
Cloth room overseer. G. G. Nicholson... 76
Congress to debate over NIRA. Paul Wooton 58
Cotton mill store. M. A. Potwin..... 250
Employer-employee relations at the end of 1934 424
Employment department reduces labor turnover. W. G. Ashmore..... 2042
Francis Gorman's letter (ed)..... 850
Greenville mills "logic" 1830
Labor provisions in report of N.A.M. and Chamber of Commerce (ed)..... 51
Lessons of the depression (ed)..... 2431
Loomfixer's job—how aided by wage incentives. R. H. Rositzke..... 66
Minneapolis "strike without a strike".1830
Pelzer, S. C., trouble results in death..1829
Report of the Bureau of Labor. Paul Wooton 228
Section 7a—questions and answers (ed) 850
Social legislation meets both favor and objection. Paul Wooton..... 228
Social security legislation. L. C. Morrow 229
30-hour week and its effect on the small mill 61
Thirty-hour week would be injurious to recovery, editors say 1064
Unemployment compensation plans..... 63
Unemployment control—A. T. Levy proposes plan 654
Union's demands for closed shop leads to closed plant — Hamilton Woolen Co. 230
Wage differential (ed) 1054
Wage differentials. D. G. Woolf..... 1057
Wage report of Bureau of Labor gives industry clean bill of health 231
Latex. See Rubber.
Linen—Merlin fabrics consist of cotton and bast fibers combined. J. C. Oliver..1639
Reweaving fabric. H. R. Reves..... 245
Linen manufacturing—Sanforizing for five years shows aggressive merchandising.1272

Looms

Loomfixer's job—how aided by wage incentives. R. H. Rositzke 66
Northrop crosses continent to see modern automatic loom. E. D. Fowle.....1060
Pick wheel take up 92
Production on silk and rayon looms....1094
"Shooting" the loom with slow motion pictures. Palmer & Ramsdell..... 881
Thread separators 895
When warp is out, fixer should check the loom 2243
Looms. See also articles under other headings.
Lowell Textile Institute—Greenville dinner 1077

M

Machinery

Capital expenditures today, can we afford. E. D. Fowle 1448
Equipment at Greenville and Philadelphia shows 1082
Knitting Arts Exhibition at Philadelphia 1080
Scrapping plan for cotton machinery in Lancashire, England. J. G. Oliver... 55
Seamless hosiery equipment surveyed... 239
Southern Textile Exposition exhibits new weaving equipment 1078
Textile machinery sales trend..... 486

Maintenance

Cleaning dye tubs 2271
Clip for lifter-rod wheel 681
Colored oil places the responsibility for stains 1834
Engineer's bulletin reminds overseer of possible economies 668
Filling storage 1099
Fire hazard. P. R. Lowe 246
Lathers on spring needle 1293
Lessening grease spots when weaving plushes 2069
Lickerins, reconditioning 1097
Link meter. W. A. Simmond..... 266
Lint on knitting machines 683
Maintennance devices shown at Greenville and Philadelphia shows 1083
Preventive maintenance. H. H. Iler..... 488
Repairing worn card-roll journals. E. E. Wagnon 267
Spinning bands 1865
Spinning-roll cleaner. F. L. Baker..... 893
Tools, proper repair. L. L. Kingsford.1645

Management

Allocation of duties in a hosiery mill. M. M. Abrams 2038
Avenues to saving 426
Impartial records check errors 2473
Manufacturers can reduce back-door losses by better purchasing. M. M. Abrams 2458
Teamwork in the Southeast. H. E. Coffin 234
Tragic future for mill unable to carry out modernization. J. M. Shelton.... 854
Manufacturing—Case studies of textile manufacturers in 1932 brought up to date 419

Merchandising

Acoustical properties of textiles. R. G. Silbar 1630
A.C.M.A. hold merchandising symposium.1071
Analyzing complaints and returns. J. M. Murphy 1097
Carpet Institution plans to improve carpet position 1862
Color and sparkle in consumers ads. John Black 1053
"Cool wool" boosted by promotional booklet 1450
Delivery dates. F. D. Manning..... 1826
Descriptive labeling and use of privately owned brands 430
Diversification solves merchandising problems for cotton mills. Mildred Barnwell 647
Fabric's the thing—Paris sets keynote Betty Hirschberg 1451
George Sloan establishes textile merchandising firm 644
Home knitting fad aids yarn sales. M. G. Barnwell 1450
National cotton week 1073
Nets, laundry and dye 1664
New roles for old fibers for 1936..... 2463
Packaging-merchandising job successful for tinsel concern 57
Rayon's merchandising effort increases in efficiency 1838
Regain world markets through cotton bounty plan. F. W. Jefferson 853
Sanforizing for five years shows aggressive merchandising 1272
Scientific selling. S. E. Thompson..... 60
Selling the finish. John Black..... 1280
Silk-rayon industry study shows need of better merchandising policy and modern equipment 56
"Silk Review" by five thousand retailers 856
Ten years of cotton textiles (table).... 650
Textile Industry should be able to make rapid shifts in production schedules (ed) 417
Metal fabrics — Copper tinsel for pot scourers and decorative tinsel 57
Tinsel fabrics. B. D. Blackman..... 81
Microscope—Cotton maturity determined by microscope 1475
Fiber candle improved for better microscope specimens. G. H. Hotte..1063

Modernization

American Yarn & Processing stresses quality yarn in modernization.....2248
Amoskeag report tells story of many a New England mill 2436
Bleach house efficiency by revamping equipment. Miles Sampson 862
Bleach house efficiency gained by machinery layout. Miles Sampson... 664
Capital expenditures today, can we afford? E. D. Fowle 1448
Federal Housing Administration extends credit to industry to modernize.....1447
Humidification system added by woolen company in continuous modernization program. F. A. Westbrook 2253
Lancashire, England, plan for scrapping spindles 1628
Manville Jenckes saves 355% by installing new equipment 2434
Silk-rayon mill study shows need of equipment and sales policies shake up 56
Tragic future for mill unable to carry out modernization. J. M. Shelton.... 854
Motion pictures of a loom. Palmer & Ramsdell 881

N

National Assn. of Cotton Manufacturers—Boston convention 2234
National Assn. of Hosiery Manufacturers—Report of Philadelphia meeting.....1074
National Association of Manufacturers and Chamber of Commerce of U. S.—Labor provisions (ed) 51
National Assn. of Wool Manufacturers—New York meeting 679
National Bureau of Standards—Studies of seam type's effect on resistance to yarn slippage. R. K. Worner.....2454

National Industrial Recovery Act

Congress to debate otver NIRA. Paul Wooton 58
Death of NRA forces textile industry to swap private "crisis" for public dilemma 1251
Door on the NRA (ed) 1055
Moving from one locality to another (ed) 226
Opinions on NRA decision 1252
Remarks about NRA (ed) 1249
Textile Planning Committee formed.... 645
Washington's reaction to NRA decision. Paul Wooton 1253
Whither NRA? (ed) 850
National Knitted Outerwear Assn.—Convention concludes with dinner 679
New enlarged offices in New York..... 258
National Rayon Weavers Assn.—Annual meeting in New York 2242

New Machinery and Processes

Assembly devices 1870
Atomizer, self-cleaning 2274
Attachment for spring-needle machines.1300
Baler, cloth 1668
Bearing adaptation 1300
Bearings, ball 1670
Bearing, cartridge-type ball 2479
Bearing, roller 2479
Bearing surfaces 1870
Belt-cutting tool 1670
Belt splice 1668
Belting, oil resistant 1871
Belting, transmission 2074
Bobbin cleaner and stripper 899
Brake, small electric 687
Breakers, oil-blast 2274
Calender, ball and roller bearing..... 1299
Capacitor, sealed 273
Carbonizer and stock dryer 899
Carriers, flexible yarn 2274
Chart, hosiery design 2075
Clipper, loop 1490
Comparator, pliability 1871
Conditioner, air 273
Conditioner, rayon 1298
Conditioning machine 2275
Conditioning unit, warp 1488
Cone, modified, for variable speeds..... 687
Control, electric 1871
Control for freight elevator 1669
Control instruments..... 272, 1670, 2074
Control unit 2479
Controller, humidity 272
Controller series 1670
Controller, temperature 2275
Cooling and conditioning machine..... 2075
Corrosion Control 2076
Coat, seamless cork 1870
Coupling, flexible 96, 2075
Cutter, rotary-knife 899
Cutter, steel strapping 1488
Cutting press 1488
Cutting and winding machine 273
Draft. ling, for roving and spinning frames 686
Drive, spinning 1102
Drive, variable speed 95, 272, 2274
Dryer, non-corroding rayon 687
Dryer, rayon 1669
Dryer, tenter 2478
Dye jig, individual motor drive..... 1489
Dyeing machinery 2074
Electrode for cutting edges 899
Elevator, portable 1299
Eliminator, midget static 272
Emulsifier, continuous 95
Extractor, single package 1489
Face-ometer 1670
Feeler motions 1488
Fingering machine 2479
First aid kit 2478
Float for spring needles 1299
Flowmeter 1670

Fog and vapor remover 96
Folding and pressing machine..... 687
Full-fashioned attachments 687
Grinder, card 94
Grinder, doctor-blade 95
Grinder, needle point card 686
Heater, unit 1298
Heddle, cellulose-strip 1300
Heddle for weaving tinsel 1870
Hose, compensated air 272
Hosiery machines 1870
Humidity controller 1668
Humidity indicator 273
Hydrometer, compensating 2478
Inspecting machine 1104
Insulator, vibration 900
Invisible identification 2478
Jack, hydraulic 1489
Joints, rubber, for chemical pipes..... 900
Knitter, multiple needle wrapping..... 1870
Knitting machinery 686
Knits jacquard girdles 1300
Label paster, motorized 95
Lamp mountings 2478
Lay-in, knitted, patented 2274
Laying-in attachment 1490
Leather specialties 1669
Length cutting machine 1299
Lever, spinning frame 1104
Light fixture, vapor proof 1670
Loom, cotton upholstery 1103
Loom for sheetings and fancies..... 898
Loom, ladder-tape 2478
Loom, silk and rayon 1102
Loom stop motions 1103
Lubrication for spinning frames..... 1300
Lug straps, canvas 899
Magnifying glass 96
Meter, air 2275
Meter, light 2274
Meter, universal 1872
Meters 2076
Micrometer valve control 1300
Microscope illuminator 2275
Moistening devices 1488
Motor, D-C, for A-C line 686
Motor, gear 2478
Motor, lint-proof 1300
Needle, hosiery 898
Nozzle, bronze air 687
Oil, spindle 686
Oscillograph, time meter and condenser. 1669
Phototube light control 1489
Pick counter 898
Plastic, rubber like 272
Plate shifter, filter-press 2479
Position transmitter 900
Power unit, variable speed..... 1103
Press, sheet packing and finishing..... 2274
Protective device for doors and windows. 2479
Pulley, tension 96
Pump, acid-resisting 687
Pump, boiler-feed 2479
Pump, centrifugal 2075, 2274
Pump, high head 1670
Pump, high pressure barrel 1871
Pump, power 273
Pump, suction 899
Pumps 2076
Redraw machine, spindle less..... 94
Reducer, motorized 272
Reed, loom 2076
Relay, auxiliary 1872
Rock salt dissolver 1103
Roll, button breaker 272
Roll covering 1871
Roving frame cone 1301
Rubber base, chlorinated 273
Sample books 2274
Scale, postage 2478
Screens, metallic 1872
Scrimp brush 2074
Separator, filling thread 2075
Sewing and rolling machine..... 2074
Sewing machine for bulky fabrics..... 1870
Sewing machine, lockstitch 272
Sewing machine drive 686
Shake-cap machine 1299
Shear, improved 1299
Sheave 2075
Sheaves for V-belt drives 2275
Shuttle, silk-rayon 687
Shuttle tension fed by bobbin battery.. 1298
Shuttle, twin grove 2075
Shuttles, improved 1102
Singeing machine 1871
Skein swift, automatic tension 1300
Slicer, cross section 1668
Speed reducer 898
Spools, molded 900
Starter, motor 2076
Starter, oil immersed 1103
Starting switch, hand control 1489
Steam trap, thermostatic 2275
Steaming finishing machine 1298
Stop motion for warpers 898
Strap retainer, steel 1103
Strapping reel 2076
Stretch control for slashers 686
Switch, limit 2074
Switch line, enlarged 273
Switch, one-unit case 1298
Switch, safety 273
Take-up rolls covering 1871
Tank lining, rubber 95
Tape, friction 95
Tape, insulation 96
Tension control for spinning wheel drives. 2478
Tension machine for card clothing.... 899
Tester, elastic yarn 898
Textile projector 1102
Timer, weld 272
Transmission, variable speed..... 1669, 1670, 2074
Trap, steam 2075
Trap, thermostatic steam 1300
Truck, hand lift 273
Twist finder 686
Twister spool 94
Valve, diaphragm 1669
Valve indicator 96
Valve, union bonnet 2275
Volt-ohmmeters, portable 2275
Warp knitting machines 94
Warper, narrow-fabric 1668
Waste conditioner 2074
Water coolers 1300
Weight controller, automatic 1668
Wet finishing machinery 1489
Wheel, continuous 272
Wheels, acetate, for filling winders..... 2478
Winder, cone 1102, 1668
Winder, knot tying 1102
Winding refinements 1669
Wrapping machine, spiral 1488
Zeolite 1301
Zeolite, greensand 1488
Northrop, James H. E. D. Fowle..... 1060

O

Outerwear, Knit

Backing wheel layout 2071
Bare rubber knitted 2461
Boucle yarn dyes unevenly 2070
Calculating presser diameters for new knit designs. J. F. Cahill 236
Code operation 473
Cotton jersey dyed with vat colors..... 894
Dinner concludes N.K.O.A. convention.. 679
Dyeing knitted fabric 268
High lights of the industry 471
Holes and imperfections. P. W. Niles.. 1262
Home knitting fad aids yarn sales. M. G. Barnwell 1450
Knitting Arts Exhibition at Philadelphia. 1080
Knitting Exhibition, Philadelphia—Textile World Guide 865
Knitwear Industrial Exposition..... 678
Latch needle design. J. F. Cahill..... 2052
Matches in knit goods dyeing. E. F. Cleveland 242
Napping knit goods 92
National Knitted Outerwear Assn. opens enlarged offices in New York..... 258
New life to outerwear 874
Outerwear week 257
Polo shirt 1848
Rib-knit fabric face. J. F. Cahill..... 2250
Setting spring needle jack pressers.... 893
Survey of economic status 471

Overseers' Corner

Bettering employer-employee relations. John Williams 2268
Carrying out suggestions 1472
Checking up on ideas and machines.... 1864
Effect of criticism on cooperation. John Williams 1292
Keeping overseers informed. John Williams 1662
Opportunity for advancement 2472
Super gets a load off his chest..... 2068
Superintendent's comment on overseers 680, 892, 1096
Superintendent's comments on overseers. John Williams 266
Superintendent Chase arrives late..... 90

P

Power

Buy coal on basis of heat units per dollar. N. T. Pef 889
Coal, steam, and drives discussed by Master Mechanics at S.T.A. meeting.... 2059
Combustion control instruments prevent fuel waste. H. E. Corl 252
Cooling condensing water equipment. C. L. Hubbard 78
Costs of fuel and labor higher in power plant. R. M. Gates 1290
Costs of power. R. E. Loper 2236
Diesel engine as source of supplementary power. C. L. Hubbard..... 1470
Engineer's bulletin reminds overseer of possible economies 668
Equipment at Greenville and Philadelphia shows 1082
Power plant performance. R. L. Rowan. 2056
Single boiler operates entire plant of Norwich Knitting Co. Waldo Hutchinson 77
Primary Textile Institute (ed) 638
Purposes and scope of new Canadian organization 852

Printing

Aniline black prints. F. A. Newton.... 2256
Desizing agents 2055
Flock printing 240
Shirtings, printed. A. A. Wynn..... 1281

R

Rayon — Production 1920-1934 for the world and the U. S. 1835
Pulp, rayon, from southern pine. C. H. Herty 1840

Rayon Manufacturing

A.S.T.M. annual report 1469
Acetate, streaks in 894
Black specks in throwing 1665
Checking rayon weaving 2473
Code operation 460
Cost break-down in percentages of all-rayon twill. R. E. Loper (chart)... 428
Courtaulds spins staple-rayon yarn on cotton machinery 238
Crepe fabrics appearance depends on throwster's soaking. C. W. Bendigo.. 864
Crepes and crepage—symposium—Rayon manufacturers' and weavers' views. B. L. Hathorne 1841; Throwing operation is crucial point. C. W. Bendigo.. 1843
Crepes — manufacturer and finisher should pool their information. C. A. Jennings 662
Crepe, rayon, wavy 2475
Creping not satisfactory..... 895
Creping problems discussed at U. S. Institute for Textile Research..... 2452
Cuprammonium crepes. I. G. Sanford.. 2438
Cuprammonium hosiery dyeing. W. H. Hand 1644
Detergents, new. David McGill..... 1270
Draperies shrink 2271
Dyeing cotton-acetate mixes with aniline black. A. J. Hall 254
Dyeing knit goods. E. F. Cleveland.... 242
Dyes for rayon 1278
Equipment and sales policies need modernization, study of silk rayon mills shows 56
Flake yarn 268
French novelties for spring..... 233
Fused collar—improved construction of acetate filler. A. A. Wynn 1059
Germany seeks raw material independence in rayon staple. O. W. Bitzenhofer.. 1452
Germany's staple. O. W. Bitzenhofer.... 2040
Glove fabric has streaks 2474
High-lights of the year 459
History of processing and the year 1785. Woolf & Chase 1265
Italy's staple. Vincent de Pascal..... 2041
Lace of 3-fibers dyed. L. A. Jordan.... 2460
Loom thread separators 895
Manufacturer, converter, finisher must cooperate for profit. C. A. Amick.. 1062
Matelasse's ramifications. C. S. Jennings 65
Merchandising of rayon increases in efficiency 1838
New roles for old fibers for 1936..... 2463
1935 fabrics 433
Opinions from industry 458
Polo shirt 1848
Practical helps for overseers 462
Price trends in rayon 460
Processing research. W. M. Scott..... 1268
Production, consumption, imports and exports of rayon, 1922-1934..... 232
Production of rayon staple fiber in different countries 1453
Production on silk and rayon looms.... 1094
Properties of rayon. J. B. Quig..... 64
Rayon knots. W. A. Simond..... 93
Rayon symposium held at A.A.T.C.C. meeting 70
Recovery process in rayon soaking. P. C. Wayner 2252
Reeds and reeding—dissecting silks and rayons 1464
Roughness in new French weaves. Mildred Barnwell 59
"S" and "Z" twist terms now standards—A.S.T.M. meeting 1469
Seam type's effect on resistance to yarn slippage. R. K. Worner 2454
Shantungs, cloques, openworks for Spring. C. C. Mattmann, Jr. 1851
Should silk and rayon warper pick the edge? F. J. Luettgen 265
6-point plan for weavers in 1936..... 2242
Sizing compounds for rayons. Genstein & Newman 1095
Spun synthetics, new methods of producing 1260
Staple rayon 1849
Stretch in slashing rayon crepe warps.. 2474
Stretching of rayon 1484
Suede, imitation 240
Survey of economic status 459
Technical developments in 1934 in rayon manufacture. H. D. Smith.... 1836
Tests and specifications progress rapidly 1850
Tinsel fabrics. B. D. Blackman..... 81
Total reported investment, income and rates of return of 765 companies in the textile business 62
Twisting speed limits 1641
Velvet, crush resistant 2039
Velvet, embossed. Howard Lyman..... 1254
Viscose-acetate milanese dyeing. L. A. Jordan 1093
Warps breaking on the loom 2271
Whizzing rayon. C. W. Bendigo..... 659
Wood pulp or linter as rayon raw material? M. Wadewitz 1652
Year's technical developments..... 461

Research

Cotton coordinated research program. H. W. Barre 2246
Dye testing for hosiery. Harry White.. 244
Fluorescence analysis. K. M. Herstein. 1274
Processing research. W. M. Scott..... 1268
Test-tube to plant—A.S.T.C.C. meeting 70

Rubber

Bare rubber knitted 2461
Bathing suits with elastic yarn foundation 2241
Elastic web puckers 2475
Latex application — use of standard batches. J. F. Hotchkiss 666
Suede, artificial 240

S

Schools—Philadelphia Textile School and Wharton School in cooperative educational program 655
Textile school graduating classes..... 1263
Silk Association of America—Why not Silk Association? Gerli, Cornet, Rosen, Goldsmith, Widder, Ix, Crane..... 2258

Silk Manufacturing

A.S.T.M. annual report 1469
Boucle yarn dies unevenly 2070
Braid, polishing 895
Code operation 466
Crepe, flat, should not have too much sheen, Philip Lebrun 2048
Crepes — manufacturer and finisher should pool their information. C. A. Jennings 662
Cuprammonium crepes. I. G. Sanford... 2438
Detergents, new. David McGill..... 1270
Drag marks on silk fabric 1665
Equipment and sales policies need modernization, study of silk rayon mills shows 56
Fabric pulls in 1484
Fluorescence analysis. K. M. Herstein.. 1274
French novelties for spring 233
High lights of the year 465
History of processing and the year 1785. Woolf & Chase 1265
Lace of 3-fibers dyed. L. A. Jordan.. 2460
Loom thread separators 895
Matelasse's ramifications. C. S. Jennings 65
New roles for old fibers for 1936..... 2463
1935 fabrics 433
Novelty-yarn construction 92
Oils, rancidity test for 1484
Opinions from industry 464
Pickers, silk 2070
Pile fabrics waterproofed 93
Practical helps for overseers 468
Presoaking silk flat crepes aids the boil-off. Philip LeBrun 2257
Preventing slack twist on old-type frames. P. C. Wayner 2269
Processing research. W. M. Scott..... 1268
Production on silk and rayon looms.... 1094
Reeds and reeding—dissecting silks and rayons 1464
Roughness in new French weaves. Mildred Barnwell 59
"S" and "Z" twist terms now standards —A.S.T.M. meeting 1469
Satin designs. C. C. Mattmann, Jr.... 1257
Seam type's effect on resistance to yarn slippage. R. K. Worner..... 2454
Shantungs, cloques, openworks for Spring. C. C. Mattmann, Jr. 1851
Should silk and rayon warper pick the edge? F. J. Luettgen 265
Silk orices and mill activity 466
"Silk Review" 856
Split ends and snowballs can be prevented by silk throwster. F. J. Luettgen 235
Survey of economic status..... 465
Tinsel fabrics. B. D. Blackman..... 81
Total reported investment, income and rates of return of 765 companies in the textile business 62
Twist, influence of, on diameter, shortening and dullness of silk hosiery yarn. Seem & Andrew 860
Twist "S" and "Z" approved at A.S.T.M. meeting 891
Twisting speed limits 1641
Unevenness in silk yarn 682
Velvet, crush resistant 2039
Velvet, embossed. Howard Lyman..... 1254
Weight control. L. T. Bonner..... 1647
Year's technical developments..... 467
Silk, raw—Moving reeds..... 1867
Prices, soaring, reflect possibility of shortage 2036
Sizing. See Finishing.
Southeastern Development Board—Teamwork in the Southeast. H. E. Coffin.. 234
Southern Textile Assn.—Eastern Carolina Division meeting 2462
Eastern Carolina Division meets at Raleigh, N. C. 1084
Master Mechanics Division meets at Gastonia 2058
Myrtle Beach, S. C., meeting 1460
Northern North Carolina-Virginia Division meets at Gibsonville, N. C.... 1483
South Carolina Spinners Division discuss roll covering 1264
Spinners Division meets at Greenville, S. C. 2255
Equipment shown at Greenville 1078
Report of Greenville meeting 1076
Spinning. See Cotton Manufacturing and Wool Manufacturing.
Standardization—Testing and rating dress fabrics standards 2051

T

Taxes

Little hope of processing tax change. Paul Wooton 1058
Processing tax. D. G. Woolf 1056
Processing taxes (ed) 1622
To sue or not to sue? 1446
Technocracy. 1935 model (ed) 51

Testing Materials

A.S.T.M. annual report 1469
A.S.T.M. Committee D-13 applauds "S" and "Z" at Providence meeting..... 891
Rayon tests and specifications progress rapidly 1850
Standards for testing and rating dress fabrics 2051
Visual examination of yarn defects.... 2069
When to stop testing. A. E. Oxley..... 1466

Textile Industry

Amoskeag report tells story of many a New England mill 2436
Better business. D. G. Woolf..... 1822
Case studies of textile manufacturers in 1932 brought up to date 419
Census of textile industry since 1914 (table) 432
Committee D-13 of A.S.T.M. holds meeting 2244
Coordinated trade association for the textile industry. Peter Van Horn.... 53
Difficulties for industry but not going to the dogs (ed) 1054
Federal Housing Administration extends credit to industry to modernize..... 1447
Federal Trade Commission report rise and fall of textile earnings 62
Fifty years of the textile industry as seen by a textile publisher. H. G. Lord 648
Fight and two dangers (ed) 1053
Four "musts" to be done now (ed)... 1443
Francis Gorman (ed) 225
Industry is on the move (ed) 2027
Letters to the editor (ed)..... 639
Liquidation boogey-man (ed) 226
NRA adjusts production to demand in cotton-textile industry (ed)..... 849
NRA and Robert Wood Johnson (ed).. 1621
Prophecy on page 1 (ed) 1819
Revival of business evident even to chronic pessimists. D. G. Woolf.... 2030
Supply-demand balance. Blanchard & Jelleme 855
Textile industry holds its own despite worries. D. G. Woolf 1445
Textile industry should be able to make rapid shifts in production schedules (ed) 417
Textile mills can revive their traditional prosperity. A. D. Whiteside..... 422
Textile personalities 2437, 2237
Textile Planning Committee formed in NRA 645
Trend of general textile activity in 1934 (charts) 420
Voluntary code conformance (ed)..... 1445
Wallace has the answer (ed) 851
Washington is trying to rationalize consumption and demand for textiles, Paul Wooton 851
What's it all about? (ed) 637
Textile Operating Executives of Georgia—Atlanta meeting discusses slashing and weaving 2054
Gyrators to drafts discussed at meeting 890
Textile Work Assignment Board—Work assignments (ed) 49
Textile World—Fifty years in the textile industry as seen by a textile publisher. H. G. Lord 648
Letters to the editor. Comer, Taylor, Plaisted, Levy 227

U

Underwear

Balbriggan curls after cutting..... 1867
Bare rubber knitted 2461
Bleaching knit goods, loss of weight in. 1866
Brief underwear 1284
Code for underwear 2446
Code operation 473
Corsets of today. J. B. Lancashire..... 876
High lights of the industry 471
Knitting Arts Exhibition at Philadelphia 1080
Knitting Exhibition, Philadelphia—Textile World Guide 865
Norwich Knitting Co. depends on single boiler for entire plant. Waldo Hutchinson 77
Shorts for men 877
Survey of economic status 471
Tension problem in underwear mills. L. G. Goldenberg 1637
Underwear Institute meets at Philadelphia 1075
Year's technical developments 474
Underwear Institute—Report of convention at Philadelphia 1075
United States Institute for Textile Research—Greenville meeting 1077
Rayon creping problems at open conference 2452

W

Waterproofing—Pile fabrics waterproofed. 93
Waterproofing glazed yarn 1098

Weaving

Making drop wires drop. Herman Hesse. 1473
Outline for setting up weave room indirect help 67
Pick wheel take up 269
Pick and pick on 4x1 1295
Two hundred weavers cross examined at S.T.A. meeting at Spartanburg..... 646
Weaving. See also articles under other headings.
Wool—Price levels for season likely to be advanced. W. H. Butler..... 1459

Wool Manufacturing

Acoustical properties of textiles. R. G. Silbar 1630
Alkalis and wool. F. R. Harrison 2247
Alkalis effect on wool discussed at A.A. T.C.C. meeting 71
Anthrax preventable. I. G. Macdonald.. 2238
A.S.T.M. annual report 1469
Camel's hair cloth finishing J. M. Masson 2069
Code operation 453
Color in weave. T. R. Hart 2059
Color in wool goods. M. H. Carothers.. 2062
"Cool wool" 1450
Count variations in woolen yarns..... 2070
Crabbing machine with steam reducing valve 893
Crossbreds, harshness of, can be overcome in finishing. G. L. Atkinson.... 1468
Detergents, new. David McGill..... 1270
Does the wool industry face a migration south? 1828
Double cloth cut effects. R. A. C. Scott. 2049
Double cloths. R. A. C. Scott..... 72
Dry marks on carpet 682
Flake yarn 268
Fluorescence analysis. K. M. Herstein... 1274
Frieze mottled 93
Fulling improved by addition of soaping box. D. W. Welsh..... 1068
Hamilton Woolen Company sold to J. P. Stevens & Co. 653
High-lights of the year 451
History of processing and the year 1785. Woolf & Chase 1265
Honeycomb pile fabric. G. R. Robertshaw 2050
Honeycomb weaves. T. R. Hart..... 248
Humidification system added by woolen company in continuous modernization program. F. A. Westbrook 2253
Japan's wool industry 2240
Mineral oil in finishing. D. W. Welsh.. 2044
N.A.W.M. meets in New York..... 679
New roles for old fibers for 1936..... 2463
Opinions from industry 450
pH control, value of. F. R. Harrison.. 1859
Pile fabrics waterproofed 93
Plush, lessening grease spots in..... 2069
Practical helps for overseers 456
Pressed felt finishing. F. A. Hayes.... 1650
Processing research. W. M. Scott..... 1268
Refrigeration applied to removal of raw wool impurities. E. H. Barker..... 1085
Reweaving fabrics. H. F. Reves..... 245
Ring-frame production 656
Roughness in new French weaves. Mildred Barnwell 59
Rugs, through-the-back. C. F. Harleston. 1258
"S" and "Z" twist terms now standards —A.S.T.M. meeting 1469
Spinning qualities of top 1665
Spotting slubs 1865
Suede, imitation 240
Survey of economic status 451
Tables for wool finishing machines.... 1473
Testing committee busy with wool standards 1256
Top quality. E. O. Kruegel 2442
Total reported investment, income and rates of return of 765 companies in the textile business 62
Union's demands for closed shop leads to closed plant—Hamilton Woolen Co. 230
Unshrinkable wool 255
Velour finishing. G. L. Atkinson..... 2450
Velvet, embossed. Howard Lyman.... 1254
Warp contraction, calculating. R. A. C. Scott 2071
Wool promotion plan submitted to industry 239
Wool and wool goods prices and activity 452
Year's technical developments 454

Woolen Manufacturing

Boys' cotton-mix suitings. J. M. Masson. 2457
Camp blankets—new designs. H. P. Galloway 661
Cops, large and soft. George Rice 265
Costs, distributing woolen mill. C. W. Bennett 1454
Diameter of woolen yarns occasionally vary from formula. J. E. Martel.... 1638
Nep Yarn 1867
1935 fabrics 433
Polo cloth construction 1294
Preventing cards from rocking 2269
Ring spinning and twisting needs variable speed. W. I. Bendz 858
Waste, bonus on scarcity 1484
Wool roping defects 2474

Worsted Manufacturing

Drawing process simplified by worsted mills. H. A. Lawrence 1832
Good worsted creeling helps spinner avoid twitty yarns. F. B. Hudson... 68
Itch from worsted suit 1295
Men's wear suitings, finishing, requires care. G. L. Atkinson 75
Neps in worsted. F. B. Hudson 1636
1935 fabrics 433
Ratching for mohair. Alfred Heaton... 658
Ring frame production 1484
Ring spinning and twisting needs variable speed. W. I. Bendz 858
Twitty yarns avoided by good creeling. F. B. Hudson 68

Authors' Index

A

Abrams, Milton M.: Allocation of duties in a hosiery mill 2038
Hosiery bags for gray goods protection. 1641
Manufacturers can reduce back-door losses by better purchasing 2458
Amick, Chester A.: Manufacturer, converter, finisher must cooperate for profit 1062
Andrew, Thruman & W. P. Seem: Influence of twist 1065
Influence of twist on diameter, dullness, etc., of silk hosiery yarn 860
Ashmore, William G.: Labor turnover reduced by employment department.... 2042
Atkinson, G. L.: Finishing velours 2450
Harshness of crossbreds can be overcome in finishing 1468
When stripes predominate 75

B

Bagley, H. W.: Pick and pick on 4x1..... 1665
Baker, F. L.: Spinning-roll cleaner 893
Barker, Edgar H.: Frosted wool 1085
Barnwell, Mildred: Diversification solves merchandising problems for cotton mills 647
Fad aids yarn sales 1450
Roughness predominates in new French weaves 59
Barre, H. W.: Coordinated research program for better cotton 2246
Bendigo, C. W.: New Grabur plant exemplifies latest silk throwing trend.... 1463
Pebble and take-up varied by formulas used for soaking rayon crepe 864
Throwing operation is crucial point.... 1843
Whizzing rayon 659
Bendz, W. I.: Larger the package the more need for variable speed in ring spinning and twisting 858
Bennett, C. W.: Woolen mill costs 1454
Berwick, F. W.: Bright shades without using basic dyes 1293
Clip marks on cotton fabric 681
Birren, Faber: Color harmony 2046
Bitzenhofer, Otto W.: Germany's staple... 2040
Rayon staple *1452
Black, John: Color and sparkle enliven textiles in consumer ads 1653
Selling the finish 1280
Blackman, Benjamin D.: Tinsel fabrics.. 81
Blanchard, F. S. & W. O. Jelleme: Supply-demand balance 855
Bonner, Lionel T.: Weight control demands attention by silk mill 1647
Brandt, Carl D.: What staple of cotton to afford good running yarn? 1833
Brend, Albert: About inspecting machinery 90
Brown, A. B.: Securing efficiency 1292
Burgess, Howard: Japanese efficiency reflected in management methods 2034
Butler, William H.: Wool—likely to hold advanced price levels for season 1459
Byrd, F. L.: More "smoke" about smoking 2068
Way to mark roving bobbins 267

C

Cahill, J. Frederick: Cutting the pressers.. 236
In rib knit fabric, which is the face?.. 2250
Latch needle design 2052
Cooper, A.: Telling the super 2472
Carmichael, W. L.: Cotton summer suitings 243
Carothers, Minna Hall: Color in wool goods 2062
Chagnon, Z. J. & H. P. Galloway: Simplified routine for finishing jersey cloth 878
Chamberlin, D. S.: Direct-running yarns... 677
Chase, Winn W. & D. G. Woolf: Anniversary hound glorifies the year 1785 in history of processing 1265
Cleveland, E. F.: Cooperation of other departments aids knit goods dyer in accurate matches 242
Coffin, Howard E.: Teamwork in the Southeast 234
Comer, Donald: Industry, labor and NRA.. 227
Cook, K. B.: Roll spacing is key setting of cotton card and spinning rooms 651
Cooper, A.: About inspecting machinery.. 90
Advancement for women 1864
Laying the floor 1634
Corl, H. E.: Blind firing 252
True by-product power 1861
Cottrell, George E.: Hosiery transfers applied efficiently 1862
Latch needle breakage 256
Seamless trends 869
Spiral float unit for seamless hosiery machines 660
Sinker-cam adjustment 2254
Cottrell, Ray: Finisher's control of pebble and take up 1845

D

Day, L. A.: Putting spindles in shuttles... 1663
Dunlap, E. S.: About purchasing 1292
Finishing circular knit goods 2473

F

Fetta, Emma Lou: Fashion futures 2033
Fowle, Edwin D.: Can we afford to make capital expenditures today? 1448
Northrop visits "child" 1060
Frost, Richard J.: Half-hose parade 870

G

Gagnon, E. E.: About purchasing 1292
Galloway, Howard Price: Camp blankets find new opportunities beckoning.... 661
Galloway, H. P. & Z. J. Chagnon: Simplified routine for finishing jersey cloth. 878
Gates, Robert M.: Power plant 1290
Genstein, Edgar S. & S. Newman: Do's and don't's in selecting sizing compounds for rayons 1095
Gibbons, Edwin J.: Methods to develop greatest flexibility of braiders 1642
Glass, V. T.: On punctuality 892
Goldenberg, Louis G.: Tension problem in underwear mills 1637

H

Hall, A. J.: Dyeing cotton acetate mixes with aniline black 254
Vat dyeing of crepons 1640
Hammett, Jas. D.: Happy days coming again for cotton textile industry..... 2032
Hand, W. H.: Controlled alkalinity assures level dyeings on cuprammonium hosiery 1644
Single bath hosiery dyeing with sulphon cyanine black B 880
Harleston, C. F.: Through-the-back rugs.. 1258
Harrison, Frederick R.: Alkalis and wool.. 2247
One mill learned the value of pH control 1859
Hart, T. R.: Color in weave 2059
Cottons selected for college style show.. 857
Honeycomb weaves 248
Hathorne, B. L.: Rayon manufacturers' and weavers' views 1841
Hayes, Frederick A.: Pressed felt finishing. 1650
Heaton, Alfred: Ratching for mohair 658
Hendricks, George: Preventing bad piecings in gilling 1663
Henry, James A.: Comments on the super's notes 2268
Herrick, William E.: Overseer should set good example 680
Herstein, Karl M.: Fluorescence analysis. 1274
Herty, Chas. H.: Rayon pulp from southern pine 1840
Hesse, Herman: Making drop wires drop.. 1473
Hirschberg, Betty: Fabric's the thing'.... 1451
Old paintings inspired current Parisian styles 2037
Hotchkiss, John F.: Uses of standard batches in application of Latex..... 666
Hotte, G. H.: Fiber candle improved for better microscope specimens 1063
Hotte, G. H. & E. R. Schwarz: Notes on technique 1477
Howard, E. P.: Experimental fabrics.... 1863
Hubbard, Charles L.: Selection of equipment for cooling condensing water... 78
Supplementary power 1470
Hudson, Frederick B.: Good worsted creeling helps spinner avoid twitty yarns.. 68
Worsted neps 1636
Hutchinson, Waldo: Operates entire plant on single boiler 77

I

Iler, H. H.: Preventive maintenance 488

J

Jefferson, Floyd W.: What to do about it?. 853
Jelleme, W. O. & F. S. Blanchard: Supply-demand balance 855
Jennings, C. A.: What makes a crepe? 662
Jennings, C. S.: Matelasse's ramifications. 65
Jones, Chester L.: Brazilian cotton could reach par with U. S. 2035
Jordan, L. A.: Dyeing 3-fiber lace 2460
Prevention of creases in dyeing viscose-acetate milanese 1093

K

Kingsford, L. L.: Proper repair tools..... 1645
Kruegel, E. O.:Top quality 2442

L

Lancashire, J. B.: Corsets of today—analysis of three knitted types 876
Lawrence, H. A.: Worsted mills simplify drawing process 1832
Lawton, T. W.: Cotton-roving twist chart.. 2045
LeBrun, Philip: Presoaking silk flat crepes aids the boil-off 2257
Too much sheen should be avoided in flat crepe 2048
Loper, Ralph E.: Cost break-down 428
Power—how much does it cost you?... 2236
Raw material is the big item of cost in industrial cottons *1629
Lord, Henry G.: Fifty years in the textile industry as seen by a textile publisher 648
Lowe, P. R.: Fire hazard 246
Luettgen, Fred J.: Should warper pick edge? 265
Split ends and snowballs 235
Lyman, Howard: Embossed velvet lends novelty 1254

M

Macdonald, Ian G.: Anthrax preventable.. 2238
Manning, F. D.: Delivery dates 1826
Martel, Joseph E.: Woolen yarn diameters occasionally vary from formula 1638
Masson, J. M.: Boys' cotton-mix suitings.. 2457
Note on finishing camel's hair cloth.... 2069
Mattmann, Carl C., Jr.: For Spring—shantungs, cloques, and other exotic fabrics 1851
Gown of royalty 1257
McGill, David: New detergents 1270
Miller, Jack: More "smoke" about smoking 2068
Miller, M. C.: Knee length among recent full-fashioned changes 872
Knock over curve calls for accurate setting of needles 1066
Moberg, Ivar: Trouble at transfer—avoid broken picks or bobbin breakouts.... 2448
Morrow, L. C.: Economic security legislation calls for ample investigation.... 229
Murphy, J. M.: Analyzing complaints and returns 1097

N

Nelson, Thomas: Avoiding knots and loose ends in seersuckers 1831
Newman, S. & E. S. Genstein: Do's and don't's in selecting sizing compounds for rayons 1095
Newton, Francis A.: Pad dyeing faults.... 1860
Practical hints in printing with aniline black 2256
Nicholson, G. G.: Forgotten man, the cloth room overseer 76
Niles, Paul W.: Things are different in this outerwear mill 1262
Norton, Howard M.: Efficiency a fetish in Japan 2034

O

Oliver, J. Guthrie: Merlin fabrics 1639
"Under the hammer" has new significance in Lancashire 55
Oxley, A. E.: When to stop testing 1466

P

Palmer, Albert & F. A. Ramsdell: "Shooting" the loom with slow motion pictures 881
Pascal, Vincent de: Italy's staple 2041
Pef, N. T.: Engineers—operating and efficiency 2471
Heat units per dollar 889
Picone, John: When warp is out, fixer should check the loom 2243
Plaisted, John W.: "Don't count on the states" 227
Potwin, Marjorie A.: Ye olde mill store.. 250
Putnam, George I.: Even shades on raw stock 1097
Scum on water 1293

Q

Quig, J. B.: Rayon's properties 64

R

Ramsdell, F. A. & Albert Palmer: "Shooting" the loom with slow-motion pictures 881
Reves, H. F.: Fabric reweaving 245
Rice, George: Cops, large and soft 265
Roberts, Herbert C.: Soaking for "ringless" 1261
Robertshaw, Ghent R.: Honeycomb pile fabric 2050
Rositzke, R. H.: Loomfixer's job 66
Rowan, Robert L.: Power plant performance 2056

S

Sampson, Miles: Finishing plant ventilation with correct hoods and fans 1648
Impartial records check errors 2473
Layout principles aid to reach bleach-house efficiency 664
Revamping bleach-house equipment for efficiency 862
Smoke and fog 2447
Taking care of bleach-house rolls.....1293
Sanford, I. G.: Cuprammonium crepes 2438
Sargisson, Z. E.: Hiring and visitors 1096
Saxl, Irving J.: Determination of crepage in yarns and fabrics 1846
Schwarz, E. R. & G. H. Hotte: Notes on technique 1477
Scott, R. A. C.: Calculating warp contraction 2071
Cut effects in double cloth by 3 and 3 interchange 2049
Double cloths 72
Scott, Walter M.: Processing research 1268
Seem, Warren P. & Thurman Andrew: Influence of twist 1065
Influence of twist on diameter, dullness, etc., of silk hosiery yarn 860
Sheeley, G. W.: Waxing knitting yarn 269
Shelton, J. M.: Tragic future for mill unable to carry out modernization..... 854
Silbar, Robert G.: Acoustical properties of textiles 1630
Simmons, John P.: Overseers' responsibilities 1472
Simond, Walter A.: Link meter 266
Rayon knots 93
Washboard and its elimination in 3-carrier hosiery 1462
Simpson, Norman: About inspecting machinery 90
Suggest record of useful suggestions... 892
Smith, Harold De Witt: Year's technical developments in rayon manufacture....1836
Stevens, G. E.: Seamless hints 74
Stevens, W. Edwin: Is the fiber ripe?....1475

T

Taylor, Frank L.: Soaping cotton prints..2440
Taylor, George W.: Coordination of textile associations 227
Thompson, Sanford E.: Scientific selling-primary textile distribution need 60

V

Van Horn, Peter: Let's put industrial self government on a business basis..... 53

W

Wadewitz, M.: Wood pulp or linters 1652
Wagnon, E. E.: Repairing worn card-roll journals 267
Waldo, R. J.: Cigarette as robber 1472
How about a "maintenance foreman"?. 266
Wayner, Peter C.: Preventing slack twist on old-type frames 2269
Recovery process in rayon soaking 2252
Welsh, David W.: Fulling improved by addition of soaping box 1068
Let the finisher know when you switch to mineral oil 2044
Westbrook, Francis A.: Humidification system 2253
Weston, Charles A.: Bunches in cotton yarn 80
Uneven picker laps 2451
White, Harry: Hosiery dyes..... 244
Spots on hosiery 1465
Whiteside, A. D.: Textile mills can revive their traditional prosperity 422
Wick, F. B.: Hot-water supply for dyeing machines 681
Williams, John: Bettering employer-employee relations 2268
Carrying out suggestions 1472
Effect of criticism on cooperation.....1292
Superintendent's comments on overseers (Overseers Corner) 266
Woolf, Douglas G.: AAA steals the show..1624
Better business 1822
Front page news! 1056
Revival of business evident even to chronic pessimists 2030
So far all's well 1445
Woolf, Douglas G. & W. W. Chase: Anniversary hound glorifies the year 1785 in history of processing 1265
Wooton, Paul: Greatest debate since Missouri Compromise promised over NIRA 58
Little hope of processing tax change...1058
New committee for textile planning formed in NRA 645
Social legislation meets both favor and objection 228
Washington says 851
Washington reaction 1823
Washington's reaction to NRA decision.1253
Worner, Ruby K.: It's pulled at the seam..2454
Wynn, A. A.: Fused collar 1059
Printed shirtings 1281
Tale of the shirt 669
Wynn, P. A.: Carrying out suggestions....1864

Textile World

VOL. 85, NO. 1 — ESTABLISHED 1868

CONTENTS JANUARY, 1935

DOUGLAS G. WOOLF
Editor

William B. Dall.....*Managing Editor*
Edwin D. Fowle.....*Associate Editor*
Winn W. Chase.....*Assistant Editor*
John Black .....*Assistant Editor*
James A. Austin...*New England Editor*
William G. Ashmore...*Southern Editor*
Paul Wooton. *Washington Correspondent*

A. P. GUMAER .....*Manager*

MANAGEMENT

Work Assignments *(Editorial)* 49
The Editor Says..... 51
Along Comes 1935—a Look into the Future..... 52
Let's Put Industrial Self-Government on a Business Basis..... 53
Background of Japan's Textile Efficiency..... 54
"Under the Hammer" Has New Significance in Lancashire.... 55
Equipment and Sales Policies Need Shake-up Says Survey..... 56
Washington Letter 58
Textile Earnings in FTC Report Rise and Fall as in Real Life. 62

MERCHANDISING

Bigness Not Essential in Good Packaging-Merchandising Job... 57
Roughness Predominates in New French Fabrics..... 59
Scientific Selling—Primary Textile Distribution Need..... 60

MATERIALS

Rayon's Properties—Knowledge Permits Consistent Quality... 64
Bunches in Cotton Yarn—a Dozen Possible Causes..... 80

MEN

30-Hour Week and Its Effect on the Small Mill..... 61
Present Status and Plans for Unemployment Compensation.... 63
Loomfixer's Job—How Aided by Wage Incentives..... 66
The Personal Page..... 98

MILL ENGINEERING

Operates Entire Plant on Single Boiler..... 77
Selection of Equipment for Cooling Condensing Water..... 78
New Machinery and Processes..... 94

METHODS

Matelasse's Ramifications—Processing Differs with Type..... 65
Good Worsted Creeling Helps Spinner Avoid Twitty Yarns... 68
Non-Run Reborn—Warp Threads Employed in New Hose.... 69
Test-Tube to Plant—Many Subjects Discussed by A.A.T.C.C.. 70
Double Cloths—Interchanging Back and Face Extends Color.. 72
Seamless Hints Based on 30 Years' Mill Experience..... 74
Finishing Men's Wear Striped Suitings Requires Care..... 75
Cloth Room Overseer Forgotten Till Trouble Starts..... 76
Tinsel Fabrics—Advice on Their Efficient Construction..... 81

NRA
CODE
GRAPHIC ARTS INDUSTRY

DEPARTMENTS

Overseers' Round-Table 90
Personal Page 98
The Textile Calendar 98
Questions and Answers 92
New Machinery and Processes 94
New Publications and Business News. 96
TEXTILE WORLD Analyst 89
Quotations 114

INDUSTRY BRANCHES

Cotton Digest 100
Wool Digest 102
Rayon Digest 104
Silk Digest 106
Knitting Digest 108
Processing Digest 110
Engineering Digest 112
Industry-Wide Events 97

McGRAW-HILL PUBLISHING CO., INC.
Bragdon, Lord & Nagle Division, 330 West 42d St., New York

Bragdon, Lord & Nagle Division

Henry G. Lord.....*President*
Frank L. Nagle.....*Chairman*
James H. McGraw, Jr.....*Treasurer*
Herbert O. Barnes.....*Secretary*

McGraw-Hill Publishing Co., Inc.

James H. McGraw.....*Chairman of Board*
Malcolm Muir .....*President*
James H. McGraw, Jr....*Vice-Pres., Treas.*
Henry G. Lord.....*Vice-President*
B. R. Putnam.....*Secretary*

Branch Offices:

Washington.....*National Press Building*
Boston.....*1427 Statler Bldg.*
Philadelphia.....*16 South Broad St.*
Greenville, S. C.....*1303 Woodside Bldg.*
Chicago.....*520 N. Michigan Ave.*
Cleveland.....*501 Guardian Bldg.*
St. Louis.....*455 Paul Brown Building*
Detroit.....*2-257 General Motors Bldg.*
San Francisco.....*883 Mission St.*
London, England...*Aldwych House, W.C. 2*

Copyright, 1935, by McGraw-Hill Publishing Co., Inc.

TEXTILE WORLD

(Formerly Textile World Journal) with which are combined *Textiles, Posselt's Textile Journal* and *Textile Advance News.* Published monthly United States and Possessions, $3 per year; Canada (including Canadian duty), $3.50; all other countries, $5, U. S. currency or 20 shillings. Single copy, 35 cents, excepting special issues.

Of this issue, 10,858 copies were printed.

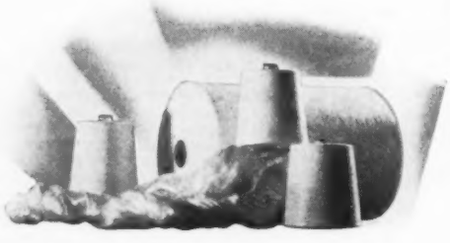
Member of Audit Bureau of Circulations
Member of Associated Business Papers, Inc.

DEPENDABLE YARNS

Spun-lo Premier Del-tone

..AND KNITTED FABRICS

THESE INDUSTRIAL products go into nearly 500 different rayon items that are sold through the regular channels of distribution. ◆◆ Products of fine character, they help determine the worth of the finished article. ◆◆ Mill executives who use SPUN-LO, PREMIER and DUL-TONE are the type of manufacturers who believe in giving their customers the *utmost in value,* and who sense the selling power of merchandise carrying well known and respected names.



INDUSTRIAL RAYON CORPORATION

CLEVELAND, OHIO

Textile World

January, 1935

▼

Editor: DOUGLAS G. WOOLF

Work Assignments

AS every textile manufacturer knows—or ought to know—there has been created in Washington the Textile Work Assignment Board. This board is composed of three employers' representatives and three employees' representatives, for cotton, wool and silk, respectively, plus an impartial chairman. Its function is to recommend to the President a method, fair to both industry and labor, of carrying out the basic intent of the Winant report.

First, it seems in order to examine the personnel. The chairman, William A. Mitchell, is an ex-cotton manufacturer with successful experience in both northern and southern mills—not to mention his side-excursion into China. The mere fact that Mr. Mitchell—an ex-manufacturer—was approved by organized labor is sufficient evidence of his impartiality.

The three employers' representatives—Earle R. Stall, John Nickerson and Harold J. Walter—all have excellent reputations in the industry. The three employees' representatives—Ruth Reticker, E. L. Oliver and Godfrey C. Brown—have had valuable experience. What we have heard of the harmony that has prevailed in the meetings of the Board assures us that all the members approach this job constructively. Let us be understood: We would not expect, nor desire, the employers' representatives and the employees' representatives to indulge in a love-feast. Despite all the academic talk about mutuality of interest between management and labor—with which we agree, again academically—each has a "side" in the controversy. We would expect each to maintain that "side." Nevertheless, we believe it is possible for six intelligent men, with an intelligent chairman, to get together and strive intelligently for a solution which will serve the interests of both sides.

▼

What is that interest which must be served?

In our opinion, there are two fundamental problems engaging the attention of the Board:

(1) How far is it possible to go toward standardizing work assignments without restricting the attempts of the efficient manufacturer to reduce costs and thereby increase return to management and labor, and at the same time restraining those few chiseling manufacturers who want to substitute over-work for manufacturing efficiency?

(2) How far is it possible to go to avoid restrictions against, and delays in, the installation of labor-saving equipment—which installation, again, means financial return to management and labor—without permitting those same few chiseling manufacturers to exploit such machinery toward over-loading of work assignments?

In answering those two questions, we must make it clear that we have no official statement from the Textile Work Assignment Board. The members have approached their problem in a spirit of research—and consequently have no pre-formed solution. Nevertheless, from our own observation of the approach made, and—more particularly—from our contacts with representatives of the industry who have been in touch with the Board, we believe the idea is not entertained that it is possible to impose an inflexible assignment of number of machines per operative upon all mills—even mills working on the same product—with fairness to both employers and employees. We doubt, further, that any restriction will be placed upon the installation of labor-saving equipment which would halt the technological advance of the industry and thus retard the progress of both employers and employees.

▼

That, we believe, answers the two main questions in the minds of textile manufacturers.

But there are other considerations. In approaching them, we should make one point clear. We recognize that the textile industry has been placed in a defensive position on this stretch-out problem. It is one of the points which organized labor—quite understandably from a strategic standpoint—has used in its warfare. Chiseling manufacturers have helped to make it an issue. The average manufacturer, however, regards it as one more sore spot.

All right. But, it is always possible to convert a defensive position into an offensive one. What we mean is this: The question of work assignments has always been, and will always be, a potential bone of contention—not only between management and organized labor,

but between employers and their own employees. There is a lot to be learned about it.

Therefore, why not utilize the services of the Textile Work Assignment Board to collate, analyze and interpret all the information it can gain on this point?

Before that is done, however, there is one very important intermediate step. As quickly as possible, the Board should determine what must be done to carry out the intent of the Winant report and the executive orders pertaining to it. No time should be lost, because uncertainty will mean loss to the industry and its workers. No matter what delay may be found necessary in developing the Board's final recommendations, immediate action should be taken to remove the actual or implied effects of a status quo period tending to retard the increase of machine assignments as a result of the adoption of improved methods and machinery. Otherwise, both the industry and its workers will suffer.

Beyond and after that, however, it would seem possible to conduct a study into more fundamental phases of the problem. As we stated before, it will always be a point at issue. The immediate conclusion of the task outlined in the preceding paragraph will not permit as thorough a study of the scientific phases of the problem as is ultimately desirable. Here too, however, we believe that conclusions should be reached as speedily as is compatible with thoughtful study, in order to avoid a source of continuing uncertainty within the industry.

We have no set agenda for the further deliberations of the Board. We hope—and believe—that its members have no such set agenda. But the possibilities of investigation are numberless. There are many problems which arise—each of which deserves the intelligent consideration of a board composed of employers and employees.

▼

Once again, let us not be misunderstood. When we referred to "employees" above, we meant just that. We did not mean the United Textile Workers of America.

We realize that the so-called "stretch-out" issue is one of the principal assets of the U. T .W. The assignment of that problem to a specially constituted board is cited by the union as one of the elements of "victory" in the recent strike. If it so desires, the U. T. W. can continue to use this issue as a football. If, on the contrary, it will use the Board created to pass on that issue as a means toward improving the condition of textile workers and their employers, it may redeem somewhat its conduct last September.

At any rate, the issue in the case seems definitely drawn: Does the U. T. W., and do the manufacturers, desire to project science into a hitherto not altogether scientific field: the problem of work assignments?

A Double-Duty Photograph

This picture reflects two important developments of the last month: (1) The meeting of business leaders at White Sulphur Springs where a plan or program for recovery was drawn up; and (2) the resignation of George A. Sloan as president of the Cotton-Textile Institute, to be succeeded, temporarily, by G. H. Dorr. Mr. Sloan continues as chairman of the Cotton Textile Code Authority. In the above photograph are shown the representatives of the cotton textile industry who attended the White Sulphur meeting. Left to right: W. D. Anderson, president of the American Cotton Manufacturers Association; Mr. Sloan; Mr. Dorr; Howard E. Coffin, chairman of Southeastern Cottons, Inc.

The Editor Says:

THE fact that the Chamber of Commerce of the U. S. and the National Association of Manufacturers got together is news. The fact that representatives of the two groups stayed together for several days and that a joint report came out of the conference is more news.

We shall confine ourself to comment on the section of the report dealing with NIRA. That section has many good points. Business is to be congratulated for recognizing that some form of legislation would have to follow the expiration of the act for at least another year. Furthermore, it is evident that the proposal advanced by the conference represented the inevitable compromise between the conservative and liberal points of view. This must be kept in mind in any criticism of the report; otherwise one's own point of view will force one to be unnecessarily harsh.

Personally, we regret that the business leaders did not merely recommend the re-enactment, for another year, of NIRA "as is." It would have saved a lot of grief —and, we believe, would have been just as satisfactory as, possibly more so than, any revised legislation which can be gotten out of the coming Congress.

However, granting for purpose of argument that it was necessary to propose a substitute law, we believe the conference has erred seriously on one particular point: failure to make some form of labor provisions, specifically those having to do with wages, and hours mandatory upon *all* industries. Under the proposal, it is optional with an industry whether it shall have a code. True, if it has a code at all, it must include labor provisions—but an industry is free to have neither.

We do not believe the country is in the mood just now to give up mandatory labor provisions. So, whether one group or another likes them or doesn't, it should be realistic enough to face the facts and recommend their inclusion.

Instead, the report contains just about the weakest statement of its type we have ever read:

"During the emergency period the problems of child labor, of minimum wages, and of maximum hours are likely to be especially acute. In any industry, therefore, not operating under a code of fair competition, in which the administration agency finds that child labor is used or threatened or wages are so low, or hours so long as to impair materially our living standards, *we appeal to employers* in such an industry *voluntarily* to apply for a code in order to prevent or correct conditions which all responsible employers condemn." [*Italics are ours.*]

Obviously, the committee still believes in Santa Claus.

Technocracy: 1935 Model

DO you remember Technocracy—the creed which in 1932 set a new all-time record with the speed of its rise and fall?

Well, we attended a dinner given last month by the Continental Committee, the successor to Technocracy, and witnessed a demonstration of the new creed. Fundamentally, it's pretty much the same as its 1932 prototype. The main difference rests in the fact that the new model has four-wheel brakes. And that's more important than it may sound. Instead of rushing ahead from facts to conclusions, as did Technocracy, the Continental Committee is trying to stop short after presenting the facts. Oh, of course it drops a conclusion or two, but nothing so startling as those advanced by Technocrat Scott, of whom the order "purged" itself some two years ago.

In other words, while Scott deduced that the days of the "price system" were numbered, and talked grandly of an "erg dollar," the new group tries to say: Here are the facts, what are you going to do about them?

The facts, as the committee puts them, are, briefly, that the American people since 1929 have deprived themselves of goods and services to the tune of 287 billion dollars, simply because we have failed to remedy our practice of *non-creating needed goods.* The research, it is held, "clearly shows (a) that poverty prevails in the United States, and always has, but that it need not exist in the future because (b) an economy of abundance would result if production were *directed toward the satisfaction of human needs and reasonable wants and restrained only by physical factors and the state of our knowledge.*"

Unfortunately the committee has inherited some of Scott's long-winded phraseology. About all that means is that the bulk of the people have far less than they need merely because of our cock-eyed system of distribution.

Scoffing May Be Expensive!

THAT of course is not new. But it warrants repeating until something is done about it.

Personally, we feel that the Continental Committee is representative of a type of thinking which is going on in different spots all over this country, under all kinds of auspices. Some if it is silly, some may be a little dangerous, but most of it is fundamentally sound. At any rate, it certainly merits more than a scoff.

People are not going to see major depressions recur with their "poverty in the midst of plenty" without thinking—and eventually doing—something about it. So the most hide-bound reactionary might find it to his own interest to take a part in this thinking and doing.

We were convinced that the Continental Committeemen we heard last month were sincerely searching for an answer. Among them, Harold Loeb had done a beautiful piece of statistical research; Felix Frazer presented the results admirably, and Dr. Walter Rautenstrauch analyzed them in an inspiring way. Of the speakers, only Stuart Chase displayed the intolerance which so many liberals acquire in their fight against the intolerance of reactionaries. The audience undoubtedly contained some "parlor pinks" but on the whole it too was composed of sincere truth-seekers.

To close on a minor key: One of our frivolous associates, while chewing Continental Committee chicken, remarked that the thing to do was to spend 40¢ a month for membership dues in the Committee, and contribute $5.00 a year to the Republican Party—"and then you're safe no matter which way the cat jumps."

Inside Information

NEXT spring, says Francis Gorman, this country will experience the worst industrial disturbances that have ever occurred.

Well, he ought to know. He manufactures 'em.

Along Comes 1935 . . .

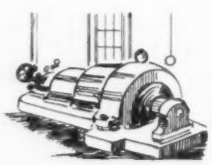
And we go to headquarters for a look into the future

IT occurred to us that our readers might want to know what 1935 has in store for other industries besides our own. It further occurred to us—modesty to the contrary notwithstanding—that editors of business papers might be a good source of information. So here is what McGraw-Hill editors think of the outlook in their respective fields. . . . . .

We shall not embarrass our fellow-editors by calling them "experts" or "authorities"—but that's what they are.—*Editor.*

Construction

"Construction looks forward to 1935 with definite and substantial expectation of improvement. Carrying forward the initial rise in volume of construction that came about during the past year as the first change from a 5-year decline of catastrophic proportions, the coming year will see a further increase, though one whose amount will probably remain moderate."—F. E. SCHMITT, editor, *Engineering News-Record.*



Power

"An appreciable number of plants modernized power equipment and operation in 1934. Indications are that more of these potential earnings will be picked up during 1935. Industry today is more modernization minded than it has been for years. This should lead to individual competitive advantage and ultimately to national economic gain."—PHILIP W. SWAIN, editor, *Power.*

Chemicals

"On the basis of work now under way and new projects still on the drafting board, one may confidently predict that chemical industry in 1935 will continue as in the past three years, to exceed by at least 10% the average activity of American industry as a whole."—SIDNEY D. KIRKPATRICK, editor, *Chemical & Metallurgical Engineering.*

Electric Light and Power

"The outlook for the coming year is somewhat obscured by several factors, economic and political. The national load is now within 6% of the 'prosperity' maximum. Individual companies have begun to break previous records. A further moderate increase will call for the installation of new equipment, making more work for the manufacturers. In the late '20s new construction ran into hundreds of millions of dollars annually. No such growth is for the present to be anticipated but the beginnings are in sight."—L. W. W. MORROW, editor, *Electrical World.*

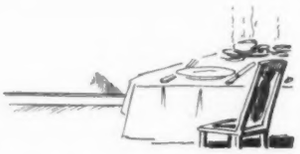
"If the psychological and political barriers to progress are removed on the one hand, and if American business will overcome any tendency there still may be to 'sit back and see what the doctor will do', 1935 will probably earn the title of 'Recovery Year.'"—MALCOLM MUIR, president, *McGraw-Hill Publishing Co., Inc.*

Metal Working

"The need for modern manufacturing facilities should be strong enough during 1935 to overcome the present hesitancy regarding long term capital commitments. Another stimulating influence is the program of equipment purchases for government arsenals and navy yards which has already been started."—KENNETH H. CONDIT, editor, *American Machinist.*

Coal Mining

"With the industry asking that code control be extended until 1937, or until some permanent check on over-expansion is established, prospects for a continuation of favorable trends throughout 1935 are distinctly encouraging."—SYDNEY A. HALE, editor, *Coal Age.*

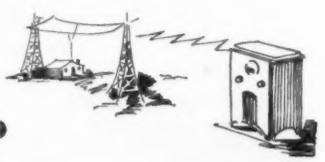


Food

"Considered from all angles, the food industries of the United States as a whole, should enjoy substantially the same tonnage volume of business in 1935 as in 1934 or 1933. Prices, f.o.b. factory, will average about 10% higher. But on account of increased manufacturing costs, both of labor and of raw materials, the net profits will only be about 5% higher than they were last year."—L. V. BURTON, editor, *Food Industries.*

Metal Mining

"On the whole, better conditions in base-metal mining must wait on recovery in the construction, manufacturing and agricultural industries."—H. C. PARMELEE, editor, *Engineering and Mining Journal.*



Radio

"Set, tube and part sales this fall are topping last year's record by approximately 35% in dollar volume. It is estimated that sales for the first half of '35 will exceed even this amazing comeback. Approximately 4,700,000 radio receivers of all types will have been sold during 1934 thus establishing an all time record for unit sales."—RAY V. SUTLIFFE, managing editor, *Radio Retailing.*

Aviation

"As 1935 approaches, the aviation industry finds itself in one of the most critical periods of its history. What the future holds is at present unpredictable as it depends directly on the recommendations of the President's Federal Aviation Commission and the resulting legislation."—LESLIE E. NEVILLE, managing editor, *Aviation.*

•

McGraw-Hill Publishing Co., Inc., made a telegraphic survey of 1935 sales budgets among a group of representative industries. Without exception, the replies indicated an anticipation of material improvement this year over 1934. The average approximates a 25% increase in business.

Let's put industrial self-government in the textile industry

On a Business Basis

By Peter Van Horn
President, The National Federation of Textiles, Inc.

◆ *In this article, Mr. Van Horn takes a long look forward and visualizes an ideal type of coordinated trade-association effort within the textile industry. As our readers know, this subject is very close to our heart. Over a year ago we recommended the formation of an organization whose scope we indicated roughly by the title of an American Textile Institute. Subsequently we urged at least an intermediate step; a council coordinating the work of existing textile trade-associations. Mr. Van Horn's vision embraces the apparel and other related industries. We consider his article a most constructive and important contribution to thinking on this subject. We hope it will not be long before some first step is taken in this direction. To repeat: Eventually, Why not now?* —Editor.

THE textile industry in America is at war.

For the last four years, the common enemy in this war of the textile industry has been our old friend the depression. In this fight the textile industry has other minor enemies, such as under-consumption—or over-production if you will—industrial relations problems, diminished prices, decreased exports, etc. The principal armies in this war are those led by General Cotton, General Wool, General Rayon and General Silk. There is no generalissimo or general staff.

Compare this situation for a moment with the World War. On the Allies' side there were armies representing France, England, Italy, Japan and America. Obviously, the Allies' cause would have been lost had each of these armies, through their respective leaders, insisted on going their own way. As we all know, to carry the war to a successful conclusion it was necessary to have a generalissimo and a general staff to do the planning for the combined armies. Any other procedure would have been worse than foolish.

In the war against depression, and in the business scramble for a fair portion of the consumer's dollar, we find the textile industry divided—not into four or five camps, but into an even larger number. Up to June, 1934, there were 66 N.R.A. textile codes approved by the President. At the same time, there were about 330 leading textile trade associations in the United States. All of the 66 code authorities and the 330 trade associations had the same objective—to help business operate at a profit. The present overlapping of effort and duplication of organization are appalling. The resulting inefficient expenditure of funds is worthy of investigation. Suppose, for instance, it cost an average of $40,000 per year to administer each of the 66 textile codes—or a total of $2,640,000—and an average of $20,000 each per year—a total of $6,600,000—to run the 330 textile trade associations. This would mean a total operating cost of $9,240,000 for all textile code authorities and trade associations.

Let us visualize for a moment the ideal organization, through code and association administration, for the textile and allied industry as a whole. As I see it, an ideal yet practical set-up should provide the following:

1. Industrial Relations Department: Today, the most important problem in the textile industry—America's largest in point of employment—is that of industrial relations. 25,000 textile and allied plants in the United States, with a normal employment of about 1,800,000 salaried workers, provide a livelihood to more persons than any other branch of manufacturing in this country. These plants produce over nine billion dollars' worth of cotton, silk, rayon and wool products in one year. An industrial relations department should be under the direction of a highly-qualified man—one who has had practical experience in industrial relations management work with some of the larger American corporations which have been handling this problem for a number of years. Such a department could suggest and direct, for the various units in the industry, the proper procedure for handling their industrial relations problems. Through the leadership of such a department, the textile industry could establish a semblance of unity in its relations with organized labor, rather than suffer the present hit-or-miss system wherein, generally speaking, individual mill operators handle the problem as emergencies arise.

2. Research Department: The second most important function of the ideal textile association is research. Our library shows that, compared with the splendid programs carried on by other countries, particularly Great Britain, textile research in this country has been neglected. Before problems can be solved they must be studied from an industry-wide viewpoint; statistics must be collected and analyzed; there must be constant research so that leaders in the industry may have the advantage of the most up-to-date information.

3. Legislative Department: It is unthinkable that any important trade group should neglect to protect its industry's interests from the standpoint of legislation. With Government today taking such an active part in industry, all organizations should take full cognizance of the importance of legislation and should prepare intelligently to present their views to governmental legislative bodies. This does not mean lobbying, as popularly conceived, but an intelligent, proper and fair presentation of facts, so that Government officials may know how to act in the best interests of both employees and employers, who make up the backbone of American citizenship.

4. Enforcement Department: The ideal trade association, which should work hand in hand with the code authority and other administrative agencies, should promote efficient industrial self-regulation with the aid of men trained to this particular work. This requires investigators and accountants capable of collecting facts and seeing the case through to a successful prosecution where a violation has been found to exist. The weakness in trade association set-up in this one particular has had a great deal to do with the adverse criticism of the N.R.A.

5. Public Relations Department: Public opinion plays an important part in any large American industry. Public opinion doesn't just happen, like Topsy. It is formed through an intelligent presentation of facts. A public relations department should be able not only properly to inform the public

regarding an industry but to provide employees with facts whereby they, too, may understand its problems. Here again, the work must be done by experts trained to all the diversified details of a public relations job.

6. Commercial Arbitration Department: The history of the textile industry has proved conclusively that commercial arbitration is an important piece of machinery in any association effort. Under some of the codes, uniform contracts are required specifically providing for arbitration in cases of dispute. Efficient arbitration departments have saved the industry thousands of dollars, have quickly and fairly brought about settlements and have facilitated business by avoiding the long and expensive delay incident to court procedure.

7. Design Protection Department: In the marketing of textiles, there are three controlling factors—design, quality and price. The most difficult to control and protect is design. The codes have demonstrated the practicality of protecting design through registration and similar methods. Any important association of textile fabric manufacturers must take cognizance of the right of ownership to create designs. Practical experience over a period of years has proved that this can be worked out under codes. A department of this kind requires trained, experienced personnel to carry on the work.

The seven departments mentioned above are those principally required, in addition to executives, to carry on with the maximum of efficiency any organized effort in the textile industry. Obviously, it is impossible for each of the textile organizations to have a complete set-up of this kind. On the face of it, there would be many needless duplications. However, if it were possible to effect a practical consolidation of a considerable number of the 66 codes and the 330 trade organizations, a more effective and economical job could be done without destroying identities. As in many other problems in the textile industry, the biggest obstacle to a sweeping change of this kind is found in one word—personality. It is natural that there should be opposition to such a program from many directions.

Last May, at a luncheon honoring A. D. Whiteside and attended by representatives of more than 90 code authorities, I advocated the formation in New York City of a Code Authority Conference. Some of the older trade association executives, for reasons which at the time appeared to be good and sufficient, opposed the idea. I bowed to their more mature judgment and, in so doing, made a mistake. If an informal conference of code authority executives could have been put into practical operation eight months ago, the history of the N.R.A. for 1934 would have been improved materially.

It would be a serious oversight on my part to conclude a statement of this kind without expressing my personal admiration for the splendid work done by many trade association executives who have given their lives to a sincere effort to aid the particular branch of the textile industry which they serve. From my contacts with these outstanding citizens, I am convinced that they would unselfishly and wholeheartedly approve any program which would put industrial self-government in the textile industry on an economical, efficient and better business basis.

Huge Economy Realized in Japan's Cotton Industry

By K. R. K.

EXPANSION of Japan's cotton industry in recent years is generally explained by the exchange value of Japan's currency as well as by its cheap labor, both of which made it able to compete in oversea markets with cotton goods from other countries. But the real factors which contributed to this success, not hitherto revealed, were studied and published by a Japanese journal named *The Toyo Kenzai Shimpo*. Following summarizes this report:

The recent economy accomplished in Japan's cotton industry, both in spinning and weaving sections, was achieved through five factors: (1) increase in efficiency of workers and equipment; (2) use of superior cotton; (3) diminution of workers and their wages; (4) economy in power costs; (5) enlargement of plant toward an economic unit.

Concerning the first item, the following table shows that as spindleage increased workers declined:

	Spindleage	Workers	Spindles per worker*
1915	2,808,000	115,174	24
1925	5,477,000	173,604	32
1926	5,411,000	182,522	30
1930	7,045,000	139,183	50
1931	7,376,000	121,659	61
1933	8,525,000	129,423	66

*Calculating all processes into one spindle.

In 1933 the production of cotton yarn from 6,740,000 active spindles reached 3,100,000 bales. This is an increase of 27% taking 1925 as basis, while the increase of spindles was 44%. Production did not increase proportionally because the industry began to spin higher counts. The increase of efficiency both of workers and machinery, however, is evident from the increase in number of spindles per worker.

Between 1925 and 1933, increase in number of looms was 10%, while gain in production was 42% and number of workers was much curtailed through introduction of automatic looms. In 1933 production of cloth per weaver increased about 260% above that of 1925.

High-draft ring spinning system had in many cases replaced the old system. It saved one process out of three. Similar economy of process was also practiced in mixing and blowing rooms. In weaving, each girl took charge of 8 to 10 ordinary power looms; with automatic looms, each weaver could attend 25 to 50 looms, producing 3 to 4 times what she used to produce.

Technical skill of workers was increased by a scientific discipline called "standard process." At the same time only workers of the best health and intelligence were employed. Abolishment of the late-night work contributed indirectly to the rise of their working efficiency. To permit increase in speed of machinery, it was necessary to use better cotton, American cotton increasing to 70% in 1933 from 40% in 1930. Egyptian cotton was used in greater quantity.

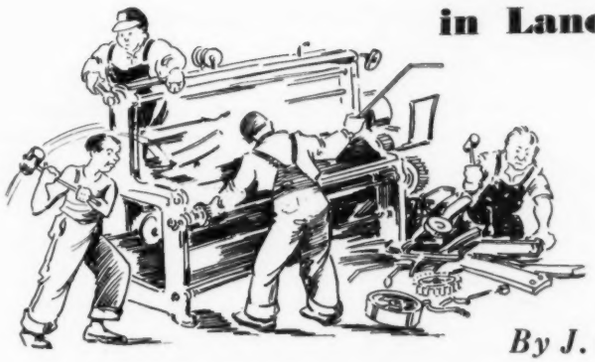
Another economy was scientific adjustment of male and female workers. Between 1925 and 1933, decrease of female operatives is recorded as 22% while that of male as 53% in spinning section; in weaving section, reduction of female weavers was 40% and that of male was as much as 74%. As the female worker's wage is far less than the male's, the reduction of such large number of male workers was a great economy. In addition there has been considerable reduction in wage level since 1930.

Replacement of steam power by electricity was the chief source of saving in power costs. Individual drive instead of lineshaft drive has served much to increase production, saving working expenses and labor, improving yarn, eliminating danger and noise, improving ventilation and curtailing dust. In 1915, the employment of electric power in cotton industry was little over 40%, while in 1933 it increased to 97%.

Increase in size of plants by extensions and absorption of smaller units has aided in the economy of the industry as a whole. Average spindles per mill in Japan increased from 25,550 in 1914 to 45,589 in 1933.

"Under the Hammer"

Has new significance in Lancashire today



By J. Guthrie Oliver

◆ *"Lancashire under the hammer." . . . . This phrase, originally used to signify the auction block, has a new meaning nowadays, for it is proposed to use the hammer as an instrument of destruction. Our Manchester (Eng.) correspondent tells us about the machinery scrapping plan which has aroused so much interest throughout the textile world. He cables under date of Jan. 8, "Redundancy ballot obtained sufficient majority and scheme is going ahead with government assistance." The article therefore reports the plan which is now being put into effect.*

THE contraction in exports of cotton piece goods to the large markets of the East, which has mainly resulted from the growth of huge cotton industries in Japan, India and China, has had the obvious effect of rendering the capacity of Lancashire's spinning mills substantially in excess of present day requirements. Large numbers of mills have passed out of existence in the last 10 years, and the machinery has been sold under the hammer, but this "survival of the fittest" process greatly burdens the trade as a whole. While there are a large number of spinning concerns all competing for a business which is insufficient to keep all their spindles running, it is obvious that few concerns can hope to run their spinning mills at maximum capacity and therefore maximum efficiency.

It has long been felt that some method of scrapping the less efficient units by mutual agreement would lead to a general increase in efficiency on the part of the remaining spinners. With this in view a committee appointed by the Federation of Master Cotton Spinners Associations was set up in the early part of last year under the Chairmanship of Lord Colwyn, and spent many months investigating the extent of the redundant spindles and the remedy for dealing with them.

The Colwyn Committee, which has now completed its investigation and issued its report, finds that it would be desirable to scrap at least 8,000,000 spindles and preferably 10,000,000 should be scrapped or sealed. The committee proposes to buy up the 10,000,000 spindles at 5s. per spindle, requiring £2,500,000, but by selling these at £500,000 based on present scrap prices the total sum to be found by the industry would be £2,000,000. This would have to be borne by the remaining 30,000,000 spindles, and if raised as a loan could be paid off in 15 years at the rate of repayment of £180,000 per year.

The Colwyn Committee considers that this would not be an undue burden on the 30,000,000 spindles remaining in the industry. In view of the greater amount of surplus spindleage in the coarse spinning section of the trade it is proposed that the levy on the two sections should be in a ratio of 9 to 7. On this basis the spinners of American and other coarse yarns would pay £657 per year for every 100,000 spindles, and the Egyptian and fine cotton spinners would pay £511 per 100,000 spindles. These figures are based on the assumption that £2,000,000 would be required and would be proportionately smaller if less capital was required. The figure would be slightly altered if part of the redundant spindleage were sealed. Not more than 1,000,000 spindles would be required for sealing and these would be at the rate of £500 per year per 100,000 spindles paid to the millowner concerns. Based on the full amount of £2,000,000 being required it is estimated that the incidence per lb. of yarn would be as follows:

American (Mule twist)	Pence.	Egyptian (Mule twist combed Sakel)	Pence.
16s	0.021	60s	0.070
24s	0.032	70s	0.086
42s	0.058	80s	0.104
54s	0.085		

This does not appear to be a large burden for the trade to carry and in any case this would be off-set by substantial savings due to the remaining mills working on more continuous full-production. The scheme if accepted by the trade would be carried out by the services of an independent accountant, who would appeal for offers of mills to be scrapped. When this was completed the board would be able to ascertain whether it was possible to go ahead with the scheme.

A ballot of spinners has already been taken, but the result has not been disclosed at the time of writing. It is generally considered that the majority of Lancashire spinners are in favor of the scheme, and the committee has already approached the president of the Board of Trade with a view to ascertaining the possibilities of making the scheme legally binding. In addition to this scheme, which will be self-supporting within the trade, it is possible that the Government will arrange a loan to the industry at a very low rate of interest for gradually replacing machinery with the most up-to-date types.

MODERNIZE!

Equipment and sales policies both need shake-up, study of silk-rayon mills shows

OBSOLETE equipment and the lack of a definitely coordinated merchandising policy are the two chief weaknesses of the silk and rayon weaving industry, and permanent improvement of this textile division hinges upon the solution of these problems. Such is the conclusion reached in a report which has just been published in book form by the National Federation of Textiles, Inc. The report presents the results of a two-year study of production and distribution in mills totaling 140,083 looms (92,355 silk and 47,728 rayon), under Silk Textile and Cotton Textile Code Authorities.

In stressing the cost of operating obsolete equipment, the need for concerted modernization is accentuated. Emphasis is also laid on the advisability of intergrating companies into larger units, though elimination of all small firms is not recommended; the point is made that reorganization which would create several large corporations would help the whole industry through establishing a sounder business condition.

The section relating to production carries the statement that the industry is deficient in research activity. More attention must be paid to such problems as unevenness, weakness, distortions of color, adulteration, slippage, shrinkage, fading, etc. Other salient points are:

More than 95% of present looms are over five years old, and it is asserted that replacement of these looms would materially reduce the number of machines needed to meet demand; in the silk textile division 83% of looms operated by commission weavers have reed width of 49 in. and more, and only 74% of stock-carrying mills have similar equipment; preponderance of 2x1 box looms among commission weavers shows a tendency to staple fabrics; less than 8% of looms are jacquards.

It is noted that code compliance has resulted in increasing the total looms in operation, which the survey committee interprets as bringing two benefits: (a) increased return on investment; and (b) increased stability in distribution. The present trend is strongly toward mixed and all-rayon production. About 60% of the goods manufactured is all-silk and 40% is mixed and synthetics. It is observed that increasing competition by southern mills which weave rayons on cotton machines may eventually force silk mills to withdraw from rayon fabric manufacture unless identical competitive conditions are afforded them under the NRA codes.

As regards labor, figures indicate that in both the silk and the rayon broad goods industry, semi-skilled and unskilled workers have received the greatest wage raise under the NRA, with the skilled group second, and the highly skilled third. Average wage raises in these group (a 40-hour base) follow: 67.1%, 55.7% and 37.2% respectively.

It is stated that there is less over-production in the industry today than at any time in a decade; however, the presence of superfluous equipment makes overproduction a continuing threat to industrial prosperity.

Proceeding to distribution problems, the report builds a disturbing picture. Conditions are particularly unsatisfactory in the silk textile division. Competition between converters and the mills which supply them with merchandise is widespread. Converters undersell their own sources of fabric supply, and, since about half the total output of stock-carrying mills goes to converters, this constitutes a major problem for the industry as a whole.

The important and exact task of styling fabrics, the report states, is spread among weavers, converters and finishers, and it is observed that the industry might benefit if this task were made the specialized function of one division.

Cooperative effort among competing manufacturers, the report considers to be a helpful force as regards prices and trade practices. However, it is considered impractical to hope to develop sales of competing manufacturers through national cooperative advertising. It is suggested that the basic difficulties in this respect are "variations of raw materials consumed, style change frequency, and price fluctuations in raw materials."

The picture also contains many bright spots, however. Piracy of designs is practically eliminated, inter-trade relationship is improved, price-cutting is "minimized" and commission weaving by stock-carrying mills is expected to be eliminated with business improvement. The industry's chief need as regards management is for "new blood" and "young leaders."

The report is introduced in a foreword by Peter Van Horn, president of the Federation, followed by a summary and forecast by Dr. Melvin T. Copeland of the Harvard University Graduate School of Business Administration, who was consultant throughout the course of the study.

Volume was edited by W. Homer Turner, research director of the Federation, Inc., assisted by Frank J. G. Duck, of the Federation research staff.

Age of Installed Looms

(Not including looms installed before 1897)

Year	Percentage of total looms installed by years	Cumulative percentage of looms installed since 1897	Year	Percentage of total looms installed, by years	Cumulative percentage of looms installed since 1897
1897	2.80	2.80	1915	6.21	48.00
1898	2.62	5.42	1916	4.18	52.18
1899	2.42	7.84	1917	3.90	56.08
1900	1.23	9.07	1918	2.07	58.15
1901	2.04	11.11	1919	12.16	70.31
1902	3.06	14.17	1920	0.45	70.76
1903	1.17	15.34	1921	0.90	71.66
1904	1.66	17.00	1922	2.31	73.97
1905	2.98	19.98	1923	1.75	75.72
1906	1.22	21.20	1924	1.86	77.58
1907	1.70	22.90	1925	7.78	85.36
1908	2.25	25.15	1926	3.20	88.56
1909	3.69	28.84	1927	2.46	91.02
1910	2.56	31.40	1928	2.34	93.36
1911	0.97	32.37	1929	2.24	95.60
1912	2.29	34.66	1930	1.73	97.33
1913	3.26	37.92	1931	1.53	98.86
1914	3.87	41.79	1932	1.14	100.00

Source—Crompton & Knowles Loom Works.

Bigness not essential for successful job in

Packaging-Merchandising

From* TEXTILE WORLD'S *New England Office

FOR many years the Montgomery Co., Windsor Locks, Conn., ran a large proportion of its tinsel equipment to supply the needs of one industrial concern. When this customer, for reasons of policy, decided to make its own tinsel cord, the Montgomery Co. was in a bad spot. Either new outlets must be found or the tinsel machinery would become a liability instead of an asset. The company had been founded in 1871, and, when the blow fell, it would have been understandable if the management had sat back and wept bewildered tears for the glories of the past. More than one old concern has passed from the picture because Fate was bemoaned and not wrestled with.

Fortunately for the Montgomery Co., its management at once settled down to the difficult task of keeping its tinsel machinery operating. A certain amount of business had always been done in decorative tinsel for Christmas trees and for tying packages, etc. These lines were pushed and, in addition, all-copper tinsel suitable for use in pot scourers was developed. The decorative tinsel was sold in bulk to concerns which wound the material on cards for retail sale and the all-copper tinsel went also in bulk to fabricators. Pushing sales in these directions was fairly successful in keeping the machinery running, but, due to narrow margins, profit was almost non-existent.

Once again the situation was not encouraging, so the company took another hitch in its belt and turned its face toward new fields. Rather than sell the tinsel in bulk, it was decided to fabricate and package finished products to sell directly to chain-store or jobber, in condition to be offered subsequently to retail customers. It is not easy for a relatively small concern to do a complete packaging-merchandising job, but the pictures tell the story of what has been accomplished by Montgomery after much hard work. The "Kwikscour" line of pot scourers and the "Rainbow" line of decorative tinsel are now fabricated and packaged for retail display.

It would be pleasant to end the story with a citation of large profits—pleasant but not particularly truthful. Times are difficult, competition keen and the Montgomery Co. has had to fight every inch of the way. But it is fighting and getting somewhere.

Greatest Debate

By Paul Wooton
Washington Correspondent
TEXTILE WORLD

Since Missouri Compromise promised in Congress over NIRA

ADVOCACY by the President of work relief for 3,500,000 persons, who in turn will require another 3,500,000 persons to supply them with materials, and his firm stand against the dole made for a dramatic opening of the 74th Congress. As far as business and industry are concerned, however, legislation replacing the National Industrial Recovery Act promises to have a much more important bearing upon their affairs.

The greatest debate since the Missouri Compromise is expected in connection with this proposed legislation, which involves the abandonment of the principles of the Sherman and Clayton acts and the substitution of the codes-of-fair-competition method of regulating business. The anticipated legislation also involves basic labor policies and the extent to which Government will have a voice in the conduct of industry. It involves also the important questions of enforcement of any law that may find its way into the statutes; the limiting of codes to industries with substantial interstate competition; and the meeting of the problem of over-production.

Second only in importance to the question of superseding the anti-trust statutes will be the battle over collective bargaining. The textile industry, as well as most other industries are ready to work against any change in the law that would result in the closed shop. There will be strong support in Congress for a revision of section 7-a of the present law so as to require majority rule. Industry will urge that minority groups have equal rights to bargain collectively and that penalties for coercion extend to labor as well as to management. The President's espousal of representation for various labor organizations in the automobile industry leads to the belief that he will oppose any mandatory majority rule legislation. He did not hesitate to recommend low wages for work relief projects in the face of the most active opposition by organized labor. With the possible exception of the soldiers' bonus nothing is at all likely to be passed over the President's veto. In most matters Congress is likely to follow closely any recommendations made by the President.

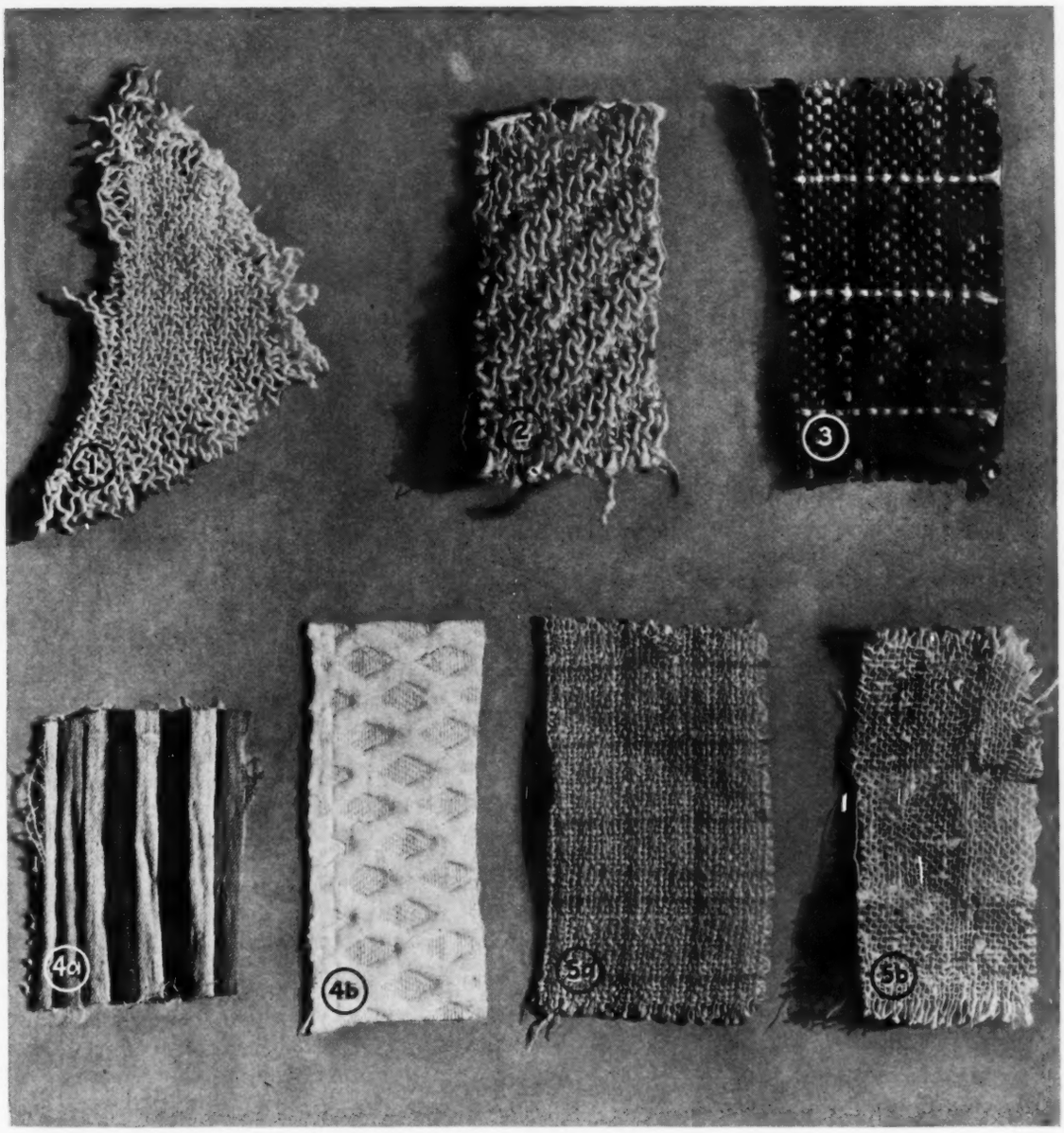
The President has made it clear that Congress will have to prescribe the taxes necessary to cover any substantial increase in items carried by the budget. The President has pledged himself to reduce the deficit as much as possible each year until it is balanced. In line with that policy the deficit for the next fiscal year has been reduced by $341,000,000, as compared with the present fiscal year. Total expenditures for recovery and relief are to be cut from $4,671,000,000 in this fiscal year to $4,012,000,000 in the forthcoming fiscal year, a decrease of $659,000,000.

Unemployment insurance and old age pensions are certain to be provided for by this Congress. Only a beginning will be made in unemployment insurance but substantial old age pensions will be voted. It is probable that this legislation will take the form of Federal aid to States. The law probably will provide that the Federal Government will pay a specified amount per person if the State will pay a like amount and will agree to abide by regulations which the Federal Government will promulgate in connection with the law. Senator Harrison, of Mississippi, chairman of the Finance Committee, favors a pension of $36 monthly, half to be paid from the Federal Treasury.

Prospects favor the compromise of the bonus question. Defeat of the compulsory 30-hour week bill is foreseen. Important banking legislation will be submitted to Congress and loans to industry will be liberalized.

Textile Division of NRA—*(Left to right) Seated, Dean G. Edwards, deputy administrator; Prentiss L. Coonley, division administrator; Col. Harry S. Berry, deputy administrator. Standing, C. H. James, executive assistant; M. D. Vincent, deputy administrator; A. Henry Thurston, deputy administrator; Col. Walter Mangum, deputy administrator; N. T. Bartlett, code assistant.*

ROUGHNESS



Predominates in new French weaves

By Mildred Barnwell
Assistant Secretary
Southern Combed Yarn Spinners Association

ON THIS page are illustrated a few of the newest weaves as exemplified by the French. These were recently brought back from Paris, and will be used by the coutour at the Spring openings. The theme song is crepe—the melody is stripes and plaids, indistinct in color but distinct in weave. Roughness in texture predominates, some weaves being so irregular as to look like an amateur's darning.

1. Simulating a hand-knit is a piece of fabric made of cable laid yarn, so tightly twisted and so loosely woven as to give a most unusual and interesting result.

2. A diagonal weave in roving and crepe thread, the predominating stripe of roving being upheld by crepe backing—a new theme in the hound's tooth, and very outstanding for coats and suits.

3. Heavy cotton homespun for men's sport jackets and beach coats, seen extensively on the Riviera.

4. The matelasse pique (a) in the Mexican manner, its vivid colorings placing it high in the opinion of the fashion-conscious, and (b) in solid colors depending upon its relief motif for distinction.

5. The ratine crepe in a variety of weights: (a) for sport clothes in the heavier versions and (b) for evening frocks in its lightest and gayest mood. This weave is not limited to stripes and plaids but is found with a solid background and a large figured motif in contrasting color —very new.

Probably the most important development, and certainly the newest, to be made in cottons, upholding the trend toward stiffer fabrics, is lacquered cotton with interwoven checks and tucks, finished in a lighter but similar manner to glazed chintz. This is important and should be watched, as it will have a definite place in the fashion world for trimmings, and for formal gowns.

Scientific Selling

The primary need in textile distribution

By Col. Sanford E. Thompson
President, The Thompson & Lichtner Co., Inc., Boston

◆ *The major recommendations advanced by Col. Thompson in his address before the textile division of the A.S.M.E. (Dec. 5) were summarized in last month's issue of* TEXTILE WORLD. *Herewith is presented part of the section of his address devoted specifically to the distribution problem of the textile industry.*

THE primary need in textile distribution is more extensive development of scientific methods of management of sales.

In mill management the progress during the last 10 years has been from that of a few mills—which might be counted nearly on the fingers of one hand—run under methods of scientific management to the introduction of these practices into the general run of textile mills. In selling, at the present time, there is a status similar to that in manufacturing some 10 years ago. A few concerns are doing a remarkably fine job; others have a long way to go.

Production Control Essential

"Perhaps the most important phase of production management at present is the planning and control of manufacturing orders and of inventory. It is essential that the master control of the kind and quantity of goods to produce originates with the selling division or agency or in close cooperation with it. There is always the tendency of the mill to desire long runs to reduce production costs and of the sales people to work on short orders. These divergent views must be reconciled through control of each kind of product based on sales, production, shipments, and inventories.

"Furthermore, not only must the production control cover the allocation of manufacturing orders, but it must be designed to maintain smooth plant operation, avoid shut downs in certain departments through congestions ahead or behind these departments, and in the individual departments prevent lost time of the operatives."—Sanford E. Thompson.

Successful selling of textiles, as does selling of other kinds of goods, hinges not simply on the character of the product sold but upon thorough analysis of all of the various factors involved such as selection of outlets, trade-mark policies, sales of the same goods at wholesale and retail, selective versus general distribution, extent of market to cover, territory per salesman, quotas for salesmen, type of salesman for region served, income to salesman, payments of salesman's expenses and plan of salesman's compensation. All and other similar factors must be worked out by the individual organization through extended study which takes into consideration the characteristics of the particular business.

It is not always recognized, moreover, that the decision on these various matters is necessary before the last item, salesmen's compensation, can be properly developed. Too often the decision on this in the sales division or with the selling agent either begs the question by selecting a straight salary or fixes a commission percentage for the salesmen based simply on volume of sales.

The ill-repute into which selling on an incentive basis sometimes falls is due almost invariably to lack of real analytical study of these various elements which affect the volume and profit on sales. To say that incentive payment is impossible because of the variety of products handled is just as absurd as it would be to say that piecework in a factory cannot be used except where all of the work is repetitive.

A brief description of a successful sales analysis which resulted in changing a company loss to a profit may illustrate the matter. In this case the products consisted of only two or three lines of textile products sold in two channels, construction and industrial. This simplified the problem. On the other hand, the determination of quotas and territories was particularly important.

In the first place a study of the market was made with reference to the extent of the present market and possible new uses for the product. With this as a basis a "market index" was found which was statistically available and could then be plotted as an indication of variations in the market demands for the products. This in turn formed the basis for re-allocation of salesmen's territories to insure the most effective selling effort at minimum sales cost. A complete budget of all selling expenses was worked out. A compensation plan was next developed designed to give an incentive to each salesman for maximum effort. From the market information obtained a re-direction of advertising and promotion effort was lined up. Finally a constructive program was put into effect for retraining of the salesmen.

As a result of this intensive program selling expense was reduced some $53,000 or about 24% with an actual increase in volume of business although general business was on the down grade. Part of this saving was due to reduction in the number of salesmen by making the work of the others more effective and partly through reduction of sales expense by introducing special rational plans for handling traveling and automobile expenses. Regarding the effect on the salesmen's work, one man, whose record showed sales below the average developed into the best man in the force by proper allocation of territory.

In diversified lines of textiles, after having settled general policies and determined allocation of territories and quotas—really the most essential features of any salesman's compensation plan whether the pay is in straight salaries or commissions or a combination of these—the adjustment of the commission or bonus must be worked out with certain definite principles in mind.

These principles require that a man should receive a reward in excess of that which he would otherwise receive for accomplishments, along lines desired and predetermined by the company. The degree of accomplishments should be in appreciable measure, although

not necessarily entirely, the result of his own efforts. He must understand the plan and know in advance what he may expect to receive in return for accomplishment. Re-rating after the act must be avoided. His income must be arranged to avoid too great fluctuation between successive pay days.

To carry out these principles several successful textile establishments have proceeded along these lines:

1. Establish definite sales policies.
2. Analyze cost of selling to conform to prices that must be charged.
3. Establish territories and minimum quotas for each territory being sure that the cost accounting give correct data on individual goods based on market study of the territory and the capacity of a salesman.
4. Frame quotas with respect to each of the individual items to be sold so that salesmen will have a definite objective.
5. Determine the relationship of direct sales of salesmen and branch office or home office sales and whether participation in compensation should be made.
6. Fix upon the amount of returns that a salesman should receive within the necessary limits of cost of sales.
7. Allocate compensation in such a way as to compensate each salesman for selling not only the required volume but also the kind of goods which the company desires to move either from profit or volume standpoint.
8. If service or "missionary" work is involved give the salesman credit for satisfactory work in this as a part of his compensation.
9. Work out plan for handling salesmen's expenses.

As in other phases of textile management it is obvious, from the diversity of selling plans and policies in different establishments of like character, that a comprehensive review is needed of the methods and practices followed by different concerns, both integrated establishments and selling houses, to illustrate which are producing the best results and to formulate standards of practice that may be utilized under different conditions.

30-Hour Week and its effect on the small mill

From TEXTILE WORLD'S *Southern Office*

IN recent months there has been much agitation both for and against a 30-hour week (meaning, on the two-shift basis, a 60-hour production week) for the cotton textile industry, instead of the prevailing 40-hour week (or the 80-hour production week). TEXTILE WORLD, in its May, 1934 issue, published an article entitled, "Is the Percentage Against the Small Mill?" According to the cost study (based on the 80-hour production week) published in connection with that article, and reproduced on this page (Table I), the percentage is decidedly against the small mill—13.4% to be exact!

Therefore, the problem now confronting manufacturers is this: Suppose that the industry should be forced to adopt the 60-hour week. What would happen to the small mill? Would the percentage against it be increased or decreased? The answer is easy. The percentage would be the same—but the *big* difference would be in manufacturing cost per yard of cloth.

Cloth from a 200-loom mill operating 80 hours per week costs $0.0098 per yard more to make than cloth from its 2,000-loom neighbor. The same cloth from the small mill operating 60 hours per week would cost $0.0123 per yard more to manufacture—the differential between the two increasing $0.0025, or a quarter of a cent!

TABLE I—Comparative Manufacturing Costs in a 200-Loom Mill and in a 2000-Loom Mill Producing Fine and Fancy Cotton Goods

Items	Total Cost Per Year		Cost Per Loom Week of 80 Hours		Cost Per Yard of Cloth		Higher Cost in Per Cent to Operate 200-Loom Mill on 80-Hour Week
	200-Loom Mill	2000-Loom Mill	200-Loom Mill	2000-Loom Mill	200-Loom Mill	2000-Loom Mill	
Depreciation	$18,000	$180,000	$1.80	$1.80	$.0072	$.0072	0.0%
Insurance	1,200	12,000	.12	.12	.0005	.0005	0.0%
Taxes	3,500	35,000	.35	.35	.0014	.0014	0.0%
Executive, Superintendent and Office Salaries	14,500	41,000	1.45	.41	.0058	.0016	262%
Supplies and Repairs	20,000	180,000	2.00	1.80	.0080	.0072	11%
Power and Fuel	21,000	170,000	2.10	1.70	.0084	.0068	24%
Miscellaneous Expenses (Less Credits)	4,000	10,000	.40	.10	.0016	.0004	300%
Labor	125,000	1,200,000	12.50	12.00	.0500	.0480	4%
Total Manufacturing Costs	$207,200	$1,828,000	$20.72	$18.28	$.0829	$.0731	13.4%

TABLE II—Comparative Manufacturing Costs in 200-Loom Mill and in 2000-Loom Mill Producing Fine Fine & Fancy Cotton Goods. (Based on 2 Shifts of 30 Hr. per Week with the Same Pay Per Week as Now Prevails For 40 Hr.)

Items	Total Cost Per Year		Cost Per Loom Week of 60 Hours		Cost Per Yard of Cloth		Higher Cost in Per Cent to Operate 200-Loom Mill on 60-Hour Week
	200-Loom Mill	2000-Loom Mill	200-Loom Mill	2000-Loom Mill	200-Loom Mill	2000-Loom Mill	
Depreciation	$18,000	$180,000	$1.80	$1.80	$.00963	$.00963	0%
Insurance	1,200	12,000	.12	.12	.00064	.00064	0%
Taxes	3,500	35,000	.35	.35	.00187	.00187	0%
Executive, Superintendent and Office Salaries	14,500	41,000	1.45	.41	.00775	.00219	*254%
Supplies and Repairs	16,200	146,000	1.62	1.46	.00866	.00781	11%
Power and Fuel	15,700	127,000	1.57	1.27	.00840	.00679	24%
Miscellaneous Expenses	4,000	10,000	.40	.10	.00214	.00053	*304%
Labor	125,000	1,200,000	12.50	12.00	.06684	.06417	4%
Totals	$198,100	$1,751,000	$19.81	$17.51	$.10593	$.09363	*13.1%

Difference $.0123 per Yd. (60 Hr.). Difference $.0098 per Yd. (80 Hr.).

*Difference between these figures and those published in May, 1934, issue of TEXTILE WORLD is due to the fact that the original figures were carried only to the fourth decimal.

From this it is obvious that further shortening of the work-week would increase seriously the handicap under which the small mill operates in competing for sales.

Editor's Note: Quoting from the article on this subject which appeared in a previous issue, we wish to call your attention to the following points:

"1. The figures shown on this page are purely hypothetical and pertain to no actual mill.

"2. The figures strive to represent an average condition and make no effort to parallel individual or extreme cases."

IT WILL BE NO SURPRISE to the average textile manufacturing company to learn that its earnings increased after NRA was started, and later fell off until it was operating at a loss before the strike. However, since it was so ordered, the Federal Trade Commission had to put the mills to the trouble of establishing these known facts.

In connection with the sharp rise in earnings after NRA, attention should be called to the fact that inventory profits played a large part in this advance. Undoubtedly this fact will be emphasized in subsequent releases on the investigation.

The FTC pays a tribute to the excellent cooperative attitude shown by the industry and its associations. From what we saw in the field during the days when the questionnaires were being answered, we feel that this attitude was largely a "grit your teeth and bear it" one. We are confident the average manufacturer is not eager for a return engagement.—EDITOR.

(Additional FTC comment on page 89; details of labor report in our next issue.)

Textile Earnings

Rise and fall in FTC report just as they did in real life

THE dramatic rise in textile earnings immediately after the start of the NRA, and the subsequent drop until a loss position was reached just prior to the textile strike, are shown in a report made public Dec. 31 by the Federal Trade Commission. This represents Part I of its report on its investigation of "labor costs, profits and investments of companies and establishments in the textile industries," as required by executive order following the general textile strike.

Of the 2,308 replies to its questionnaire received by the FTC, 765 representing approximately one-third of the companies reporting have been used in this report. Table I shows the total investment (excluding goodwill), income from all sources, and rates of return on total investment for these 765 companies engaged in the textile business for the four periods the order called for.

Total investment of these companies was about $1,200,000,000 throughout the period. In the first six months of 1933, they earned at the rate of 3.12% per annum on the investment. The second six months' period following the establishment of the NRA and the adoption of codes showed an increase of 2½ times the net income of the companies; the rate of return during this period was 7.95% per annum. In the first half of 1934, however, profits fell to approximately 60% of those for the preceding six months' period and the rate of return declined to 3.35% per annum or only slightly more than in the first half of 1933. In the two months immediately preceding the strike, there was a further sharp decline in earnings, all but one of the five major groups reporting a loss for the period.

The report also presents data showing the rate of return for the total investment of these companies as against that for merely their textile investments. The two were very close, but the return on the textile investments was slightly better than that on the outside investments. In addition, data are included showing return on stockholders' equity; although higher than that on total investment in each of the three six months' periods, this shows a very much greater rate of loss in the two months' period preceding the strike.

Insofar as the rate of return in the individual branches of the industry was concerned, it will be noted from Table I that the wool division rose to a higher annual rate during the immediate post-NRA period than did any other branch, but fell also to a position where it registered the second largest loss in the two months before the textile strike. It will also be noted that the companies belonging to the silk and rayon group showed a net loss on total investment in each of the four periods under review.

With respect to the cotton division, the report states: "It is to be noted that investments and rates of return shown for northern and southern mills reflect conditions as to ownership, management, labor forces and the wage levels that differ as between the two sections of the country. With the establishment of the cotton code, recognition of these differences was given in the fixing of minimum wages per week at levels somewhat less than those of the North. It is to be noted, therefore, that the high rates of earnings shown by the southern mills are made under wage differentials which, it is claimed, do not fully reflect differences in wage purchasing power in the two sections, particularly when housing and other services furnished by southern companies are taken into consideration."

TABLE I—Total Reported Investment (Excluding Good Will), Income and Rates of Return of 765 Companies in the Textile Business

Kind of business	No. of Co's.	Jan. 1 to June 30, 1933	July 1 to Dec. 31, 1933	Jan. 1 to June 30, 1934	July 1 to Aug. 31, 1934
		Investment[a]			
Cotton:					
Northern Mills	104	242,260,298	252,611,250	262,814,135	259,795,557
Southern Mills	230	423,108,685	430,585,640	441,513,089	437,141,954
Dyeing and finishing	75	93,992,834	93,606,721	94,328,967	92,973,070
Total cotton	409	759,361,817	776,803,611	798,656,191	789,910,581
Wool	129	183,609,888	197,555,039	204,332,072	196,856,998
Silk and rayon	201	130,374,178	127,059,658	125,094,858	124,225,732
Thread	19	53,547,819	54,630,234	55,189,500	52,095,544
Cordage	7	57,137,012	58,171,742	58,747,916	55,626,045
Total	765	1,184,030,714	1,214,220,284	1,242,020,537	1,218,714,900
		Income[b] (Income from outside investments included)			
Cotton:					
Northern Mills	104	720,670	6,489,899	169,533	1,821,661*
Southern Mills	230	10,197,416	21,664,410	13,176,340	324,227
Dyeing and finishing	75	1,617,005	1,562,791	1,524,208	1,362,244*
Total cotton	409	12,535,091	29,717,100	14,870,081	2,859,678*
Wool	129	1,498,254	13,203,581	618,586	2,322,983*
Silk and rayon	201	1,289,514*	818,817*	1,031,595*	1,307,792*
Thread	19	2,871,175	2,986,103	3,053,810	426,419
Cordage	7	2,886,525	3,157,075	3,271,477	434,827
Total	765	18,501,531	48,245,042	20,782,359	5,629,207*
		Annual Rate of Return			
Cotton:					
Northern Mills	104	0.59	5.14	.13	4.21*
Southern Mills	230	4.82	10.06	5.97	0.445
Dyeing and finishing	75	3.44	3.34	3.23	8.79*
Total cotton	409	3.30	7.65	3.72	2.17*
Wool	129	1.63	13.37	.61	7.08*
Silk and rayon	201	1.98*	1.29*	1.65*	6.32*
Thread	19	10.72	10.93	11.07	4.91
Cordage	7	10.10	10.85	11.13	4.69
Total	765	3.12	7.95	3.35	2.77*

[a]Including total capital employed, both owned and borrowed, and outside investment, but excluding good-will.
[b]Income is shown before deduction of interest on borrowed money and Federal Income Tax.
*Loss.

A digest of present status and outstanding plans for

Jobless Compensation

"FACTS ABOUT UNEMPLOYMENT COMPENSATION" is the title of a report just prepared by the Committee on Social Legislation of the National Conference of Business Paper Editors. It summarizes the status of national and State legislation, and gives the salient points about each of the most important plans proposed to date. An abstract of this report is presented herewith. Copies are available at 10c. each at the Conference Office, 330 West 42 Street, New York.

Probably no one subject demands more serious consideration by manufacturers at this time. It is not a question of whether an individual is "for" or "against." It is, rather, a question of becoming intelligently informed on a problem which is engaging national attention.—EDITOR.

THERE is no doubt that the legislatures, both State and national, in 1935 will give a great deal of consideration to the subject of unemployment compensation. It is a definite goal of the Administration at Washington and bills to provide some method of compulsory unemployment compensation were introduced in 25 State legislatures in 1933 and in 5 of the 9 legislatures which met in 1934. Congress and 43 State legislatures meet in 1935, and at least one proposal will be introduced in each one of them.

Of greatest significance is the possible passage by Congress of the Wagner-Lewis Bill, modified probably by the Committee on Economic Security of which Secretary of Labor Perkins is chairman. Passage of such a bill would compel every state to enact laws to protect its citizens against the full force of the Federal excise tax which would otherwise be imposed upon them. This bill imposes a 5% tax on the payrolls of all employers of ten or more persons with a few exceptions. Employers who contribute to State unemployment compensation systems which meet the minimum standards set up in the bill may deduct from their Federal excise tax the full amount of such contributions.

TABLE I—Essentials of Unemployment Compensation Plans

	Wisconsin Act	"American Plan"	Ohio Plan	Massachusetts Plan
1. Minimum Number of Employees Covered	10	4	3	10
2. Eligibility Requirements				
Work in State	...	13 weeks	26 weeks	...
Service with Employer	2 weeks	...	...	8 weeks
Maximum Income	$1,500	$2,000	...	$1,500
3. Compensation				
Rate: Per Cent of Earnings	50%	50%	50%	50%
Maximum, per week	$10	$15	$15	$10
Minimum, per week	$5	...	...	...
Number of Payments.				
Normal	1 for 4 weeks	1 for 3 weeks	16 weeks	based on service
Maximum	10 weeks	16 weeks	...	...
Uncompensated Waiting	2 weeks	3 weeks	3 weeks	4 weeks
4. Contributions—Employers				
Rate of Payroll	2%	3%	2%	2%
Minimum Employee Reserves	$55	$65	Pooled Fund	$50
New Rate	1%	1%	...	1%
Maximum Employee Reserves	$75	$100	...	$75
5. Contributions—Employees	no	may	1%	...
6. Type of Reserve Fund				
State	yes	yes	yes	...
Isdustry	may	may	...	yes
Plant	may	...	...	yes
Individual Accounts	yes	yes	yes	yes

Other outstanding plans under consideration are:

Recomendations of the President's Committee: The recommendations of the President's Committee on economic security follow generally the principles of the Wagner-Lewis Bill. They set up, however, more definite minimum standards for all State unemployment compensation laws. The recommendations are embodied in what is called a grant-and-aid plan which calls for a Federal tax of 3% on payrolls to provide funds for the Government subsidies to State programs, but does not bar individual States from drawing funds from employees as well as employers. Under this plan, Federal grants would not be made to States which provide for payments of less than $15 per week to unemployed workers for 15 weeks in any one year, payments to begin not less than four weeks after loss of employment.

Interstate Commission Recommendations: The Interstate Commission on Unemployment Insurance representing the Governors of New York, Massachusetts, Ohio, New Jersey, Pennsylvania and Connecticut, recommended that each of these six States adopt a compulsory law. Details of the commission's recommendation include: payment by each employer of 2% of his payroll to an employment reserve fund to provide compensation for his own unemployed workers; compensation of 50% of normal earnings, but not than $10 a week to be paid for a maximum of ten weeks during any 12 months.

Wisconsin Law: The only unemployment compensation law now in effect is that which operates in Wisconsin. All employers of 10 or more persons are included in the act except employers in highly seasonal industries and of certain other types of workers. Employers contribute 2% of their payroll.

The "American Plan": Another proposal which has been introduced in a number of State legislatures and is expected to be introduced in every legislature which meets in 1935 is the so-called "American Plan" developed by the American Association for Labor Legislation. This bill applies to all employers of four or more persons, or whatever number is specified in the state workmen's compensation law. It has the exceptions common to most proposals. Compensation of 50% of normal earnings, but not more than $15 a week, is to be paid, after three weeks of uncompensated employment, for a maximum of 16 weeks during any year.

Massachusetts Commission Proposal: Under the plan proposed by the Massachusetts Commission for the Stabilization of Employment, all employers of 10 or more persons would be required to contribute 2% of their payrolls to the State Treasurer who would account each employer's fund separately. When an employer's reserve fund amounted to $50 for each of his participating employees, contributions would be reduced to 1% of payroll and would continue until a reserve fund of $75 had been established.

The Deane Plan: The plan proposed by Albert L. Deane, vice-president of General Motors Acceptance Corp., is a somewhat different approach to the problem. He describes it as "a proposal for automatically eliminating unemployment and sustaining purchasing power." At the close of each year the average weekly hours of employment of all eligibles for the previous 10 calendar years would be computed, giving a long-time average. At the close of each month the average weekly hours of employment for the month would be computed to obtain the current "monthly average." Whenever the "monthly average" was *below* the "long-time" average, the pay of every eligible would be supplemented out of a National Reserve Fund by an amount equal to 1% for each hour or fraction thereof that the "short-time" average was below the "long-time" average. Every employer would pay a payroll tax into the National Reserve Fund only when an employee, in any six months period, was employed more average weekly hours than the "long-time" weekly average. The tax rate would be 1½% of the total pay of such employees for each excess hour above the "long-time" average.

Rayon's Properties

Wider dissemination of available knowledge will enable consistent production of quality fabrics

By J. B. Quig, Ph.D.
Dupont Rayon Corp.

IF the available knowledge of the basic properties of the synthetic fibers was more widely disseminated and understood, the consistent production of uniform quality fabrics would be easier and the losses incurred from defective fabrics would be minimized. A knowledge of the effect of excess and non-uniform tensioning and the consequent over-stretching and non-uniform stretching of rayon is of the greatest importance. It is also necessary to consider the moisture content of the rayon and its relation to the extension or stretching of the rayon fiber.

Urquhart and Eckersall, in Fig. 1, show that regenerated-cellulose rayons have absorption curves similar to those given by cotton and mercerized cotton. The regain rate curves (Fig. 2) show the time required for rayon to come to equilibrium at a definite relative humidity and temperature. Viscose rayon, when at equilibrium at 65% relative humidity at 70° F., has approximately 14.8% regain. Starting with bone-dry rayon, 12.6% regain is attained after 1 hr., and it then requires at least 24 hr. to acquire 2.2% additional regain to reach equilibrium. If we humidify a viscose rayon having 7.5% regain, it requires 1¼ hr. to reach 12.6% regain. If we begin humidification at 13% regain, a lower equilibrium value is obtained than if we humidify a bone-dry or a 7.5% regain sample. This phenomenon has not been explained. Cellulose acetate, when at equilibrium at 65% relative humidity at 70° F., has approximately 6.7% regain. Starting with bone-dry cellulose acetate, 5.8% regain is attained in 1 hr. It then requires 19 hr. to acquire 0.9% additional regain to reach equilibrium. Since the uniformity of moisture content depends upon the bulk of the yarn exposed, the nature of the package, and the circulation of air, a safety factor of 10 to 12 hr. should be added.

A reasonable percentage of moisture acts as an excellent softening agent. It is necessary to have 8 to 10% moisture in viscose rayon and 6½% moisture in acetate to produce the necessary suppleness and pliability for good knitting and weaving of the synthetic yarns.

When viscose yarn is wet thoroughly, it loses approximately 50% of its dry strength, while its elongation increases approximately 30%; acetate loses approximately 40% of its dry strength, while its elongation increases approximately 20%. As the relative humidity increases from 40% to 60% (75° F.), viscose rayon loses 16% in its breaking strength.

The tension in grams required at 40% and 80% relative humidity to stretch 100-denier viscose and acetate yarns 1% and to reach the elastic limit is shown below.

		To Stretch 1%		*To Reach Elastic Limit*	
		40%	80%	40%	80%
Process	*Denier*	*Gms.*	*Gms.*	*Gms.*	*Gms.*
Viscose	100	75	35	90	35
Acetate	100	46	36	80	50

In Fig. 3 is shown the maximum permissible tensions in knitting and weaving mills on viscose acetate.

Other studies on the effect of tensions at various relative humidities indicate that it is not desirable to process viscose process rayon at a relative humidity higher than 65%. Acetate processes better at a slightly higher humidity. Insofar as possible, weavers should keep separate their cotton and rayon weaving.

When a yarn is stretched in processing, it is wound on beams, quills, etc., and is given little opportunity to recover from the stretch until it reaches the gray cloth. The recovery in the gray cloth is negligible. When the fabric is wet out by the dyer and finisher, the strain is released and contraction takes place. In Fig. 4 are shown the relative recoveries from various dry stretches of 100-denier viscose and acetate and 7/15 canton silk.

The curves in Fig. 5, plotted by Mauersberger, using the figures of Delph, show the percentage of recovery after stretching, assuming the rayon threads are free to contract. These curves give a definite indication why the fullness and coverage of fabrics can be vitally affected by overstretching in sizing, dyeing and finishing.

Abstract of paper delivered at annual meeting of American Association of Textile Chemists & Colorists, Dec. 7 and 8, in New York.

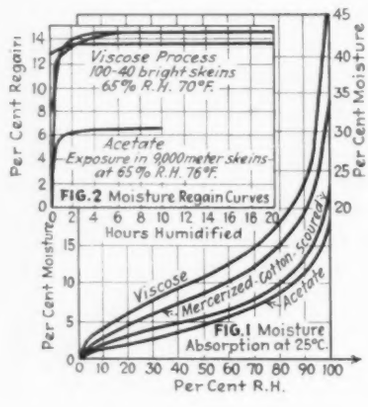


FIG.2 Moisture Regain Curves

FIG.1 Moisture Absorption at 25°C.

FIG.3 Maximum Permissible Tension at Various Relative Humidities

Denier	R.H. Per Cent 60	65	67.5	70	75
50	25	25	20	17	15
75	37	37	30	26	22
100	50	50	40	35	30
150	75	75	60	52	45
200	100	100	80	70	60
300	150	150	120	105	90
450	225	225	180	157	135

Tension in Grams

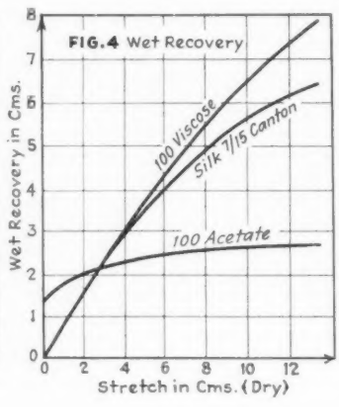


FIG.4 Wet Recovery

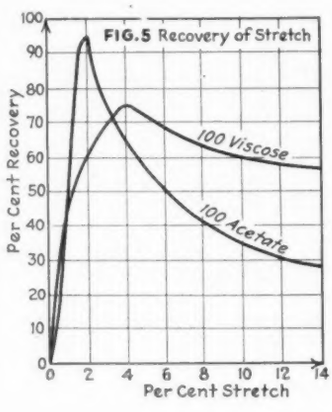


FIG.5 Recovery of Stretch

Matelasse's Ramifications

Processing of silk, rayon, and cotton differs with each type of fabric

By C. S. Jennings

MATELASSÉ, called by some the outstanding fabric of the day, is, from the viewpoint of the finisher, not one fabric, but many. Comparable in construction, silk, rayon, and cotton matelassés require different treatments in the finishing plant. In general, however, the methods and equipment employed for matelassés made from silk are, with some modifications, suitable for those made from rayon. On the other hand, the preliminary processing of cotton matelassés varies considerably from that of either silk or rayon fabric.

Silk matelassés when received by the finisher are carefully inspected and checked for yardage and percentage of take up. Each piece is then marked on both ends with the piece number, yardage, and lot number. Next each piece is put in a separate net, or in a separate section of a dashwheel, and is treated in the dashwheel for 20 to 30 min. at the boil with a solution of soap and sulphonated oil. The pieces are then washed with warm water, rinsed with cold water, and removed from the machine. The tangled mass is now straightened out, and the pieces are either tied or sewed end to end and transferred to a reel dyeing machine.

The treatment with soap and sulphonated oil removes enough of the sizing materials from the gray goods to allow the crepe yarns to take up completely and form the desired crepe effect in the fabric. From this point on it is necessary for the finisher to maintain this effect. For this reason, the pieces should be trucked from one machine or department to the next and should not at any time be pulled in rope form from one part of the plant to another.

In threading up the fabric on the reel dyeing machine, the operator should run only one piece to a section. Reels which will handle from six to fifteen pieces are the sizes ordinarily employed. The fabric is degummed in the usual manner and then is dyed in the same machine, or is transferred to another similar machine for dyeing. If the goods are wanted in a white or cream shade, a light peroxide bleach takes the place of dyeing. After the dyeing or bleaching operation has been completed, the pieces are removed from the machine, hydroextracted, placed in a box truck, and sewed end to end. The goods are next opened by hand over the old-type hand-opening reels into another box truck.

For drying silk matelassés an apron-type air dryer with a quetsch at the entering end is employed. The quetsch contains either a softening solution or a sizing solution, depending upon whether a soft or firm type of finish is required. From the dryer the goods are sent in a box truck to a silk-type tenter frame. A run over the frame brings the fabric to the desired width and removes any bow in the filling. Leaving the tenter, the goods should be batched on a very loose roll at the take-off end.

Every effort should then be made to obtain the desired finish at this point. Here the matelassé effect shows to the best advantage, and any further processing will detract from this effect. Frequently, however, a light calendering on a silk-type calender or a run over a Palmer may be necessary to obtain exact handle or appearance desired.

All-rayon matelassé can be handled to the best advantage in about the same manner as has been described for silk fabrics. The major difference is that a scouring treatment, such as is used for other types of all-rayon materials, takes the place of the degumming operation necessary for silks. In the case of rayon fabrics which are to be finished white, bleaching is not always necessary. When it is, a light treatment either with peroxide or sodium hypochlorite is suitable.

All-cotton matelassés require a thorough treatment to remove the fats, waxes, and other impurities. With these fabrics, creping in the dashwheel is carried out in the same way as for silk and rayons. The pieces are then knotted end to end and sent to the kier room. It is necessary that the goods be reeled in to the kier carefully.

Excessive tension, which would stretch the cloth and spoil the matelassé effect, must be avoided. The kier must not be loaded so heavily as is the practice with ordinary cotton piece goods. The goods can be boiled out in the usual manner, rinsed, allowed to drain well, pulled out of the kier over reels into trucks. They are then transferred to the reel dyeing machines where they are washed, scoured, bleached with chlorine or peroxide, and dyed. An even better method, if a suitable kier is available, is to boil out and peroxide bleach the fabric in the kier and then transfer it to the reel machine for dyeing. Actual finishing of cotton matelassé differs little from the finishing of silks.

Like most novelty fabrics, matelassés can be finished as a fill-in product, but not every plant is organized or equipped to handle them to advantage. For example, processing of matelassés requires considerable manual labor and—since the equipment used is generally scattered throughout different parts of the plant—a large amount of trucking. Manual labor and trucking are expensive. Therefore the finisher who contemplates the processing of matelassés should make a careful check of his costs to make certain that he is not taking on a line which will cost the plant money rather than yield a profit.

The Loomfixer's Job

And how it is benefited by properly planned wage incentive

By R. H. Rositzke
R. H. Rositzke & Associates
Management Consultants

ANY analysis of the problem of properly controlling or planning fixing must start with the fixer. How can his activity be controlled? What will spur him on? The two answers are: (1) to rate a fixer on the basis of loom efficiency in his section; (2) to measure all of the work a fixer is responsible for and compensate him according to results shown. The first method implies the big stick, which is gradually but certainly being discarded. The second, through inducement, stimulates a healthy activity. It is not a common method, but is far greater in its result value than the first.

The interpretation of what the fixer must do varies considerably in different mills. In some, he is practically a second-hand, responsible for loom condition, cloth inspection at the looms, approval of start-ups, etc. In equally as great a number of mills cloth inspection and start-up approval are placed under separate control. Others simply await kick-backs from the perch. All such arrangements have their values and limitations.

Too much cloth inspection at the looms results in weavers passing the buck and quite frequently causes greater, rather than less poor work. Having fixers responsible for start-ups is satisfactory in a plain-cloth mill of few styles or patterns, but a different type of control is necessary in a "made-to-order" or specialty type of manufacture.

The major point to be emphasized, however, is that the duties of the fixer should be carefully defined and assigned to him before any attempt is made to offer him a definite inducement to improve his own job. The following is a sample definition of duties: (1) He shall maintain looms in the best possible condition. (2) He shall so schedule his time that warps are started immediately after set-up crew has installed beams. (3) He shall cooperate with operators on all necessary repairs so as to reduce loom down time and keep up earnings. (4) He shall be assigned a definite section of looms, but it is his duty to aid other sections when his work is light and the other sections are running heavier. At start-up he should perform the duties outlined on the opposite page.

If such a definition of duties holds, then the following measuring sticks may be used to determine how well a fixer has performed: (1) A comparison should be made between the actual loom hours run in each section with the number of hours they should have run if operated efficiently. (2) A credit should be given for each warp started in a section. (3) A credit should be given for the condition of looms in each section as found by the loom inspector.

The first two items of information are available in most mills. However, a method for measuring the condition of a loom has been devised. It may be applied as follows: (1) Establish a person (a part-time job in most cases), not under the weave-room foreman, to make an unbiased inspection of every loom once a month. This on a routine basis takes between 20 and 30 min. per loom. (2) Provide the inspector with a form similar to the accompanying Loom-Inspection Report whereon he can rate the various parts *A, B,* or *C* according to whether they are slightly, considerably, or badly worn. (3) Set up credit points for the various parts of the loom, a perfect loom to be credited with 100 points. Deduct all *C* parts, for a badly worn condition should not exist if the fixer is on the job. (4) Give each fixer his own rating, but calculate the performance of all fixers as one group.

Fixers are as human as all of us. Owners of business are fundamentally in it for the profit that can be attained. Piece-work operators, if rate-setting practices are fair and accurate, are out to make as much as they can. Day work or profitless performance is no inducement for

TABLE I—SCHEDULE OF ALLOWANCES

	Units per Month	Apport. Hrs	Fixers' Hrs.
Std. loom hours	24,000	500	20.8 per 1000
Std. warps started	500	250	50.0 per 100
Std. loom-hour saving	2 400	400	16.7 per 100
Std. loom-cond. points	22,400	650	29.0 per 1000
BUDGETED FIXERS' HRS. 1300			

TABLE II—SUMMARY AND ANALYSIS, LOOMFIXERS' BONUS

JULY, 1934

Activity Credit	Credits	
Loom hours for month	19,200	
Fixers' allowance per 1000 loom hrs	20.8	
Total fixers' volume credit	399.36	399.36
Warp-starting Allowance		
Warps started	500	
Fixers' allowance per 100 warps	50.0	
Total fixers' warp-starting credit	250.00	250.00
Loom-Efficiency Credit		
Loom hours saved	1,200	
Fixers' allowance per 100 saved loom hrs	16.7	
Total fixers' loom-efficiency credit	200.40	200.40
Loom-Condition Credit		
Standard loom-condition points	186.86	
Fixers' allowance per 1000 points	29.0	
	541.89	541.89
Total loomfixers' cr.		1,391.65
Actual loomfixers' hrs.		1,125.00
Gained bonus hrs.		266.65
Bonus hours distributed to fixers (50% of gained hours)		133.33

TABLE III—SCHEDULE OF BONUS DISTRIBUTION

Loom-Fixer	Payroll Hours	Earned Bonus Hrs.	Rate	Bonus Pay
1	140.00	16.50	.80	$13.20
2	155.00	18.22	.75	13.70
3	145.00	17.10	.65	11.15
4	130.00	15.20	.70	10.64
5	150.00	18.81	.75	14.11
6	135.00	16.00	.80	12.80
7	140.00	16.30	.70	11.41
8	130.00	15.20	.80	12.16
	1,125.00	133.33		$99.17

TABLE IV—LOOM-CONDITION ANALYSIS

	Points	Deductions	Credits
Drive mechanism	1,120	6	1,114
Take-up motion	5,600	276	5,324
Let-off	2,240	12	2,228
Lay motion	1,120	60	1,060
Protection	1,120	18	1,102
Pick motion	2,240	72	2,168
Head motion	4,480	36	4,444
General	2,240	1,014	1,226
Lubrication	1,120	1,100	20
Cleanliness	1,120	1,120	....
	22,400	3,714	18,686

either owner or workers toward obtaining the best results. The time-worn adage, "An ounce of prevention is worth a pound of cure," is brought home to fixers through this type of compensation.

This is true because—(*a*) The inspection sheets give each fixer a definite indication of *B* and *C* parts which, if he follows it, will avoid major smash-ups and repairs. (*b*) The inspection, if properly made, is unbiased and gives the fixer a bird's-eye picture of his loom conditions. (*c*) There is a definite financial goal, should he succeed in keeping looms in first-class condition. (*d*) It is possible to give a competitive rating to fixers which stimulates pride of performance and eliminates a feeling that favoritism exists. The latter feeling is usually present where effort and performance are not measured. (*e*) The group-incentive idea provides a co-operative feeling between fixers and gives a much-needed flexibility to the crew during changing periods of volume in different sections.

LOOM INSPECTION REPORT
SUMMARY OF 224 LOOMS

LOOM NO. ALL LOOMS DATE 7/31/34
LOOM FIXER ENTIRE CREW
GENERAL LOOM CONDITION:

RECOMMENDATIONS: THAT AN ESTIMATE OF REPAIR AND REPLACEMENT COSTS BE MADE FOR EVERY LOOM

INSPECTED BY JOHN SHARPEYE

REPAIRS ESTIMATE

Material and Parts Required	Est. Labor Hours	Est. Cost
Total		

LOOM CONDITION RATING	RS	Pts. Lost	% Loss & Light Bm.	Allowances	Net Points
DRIVE MECHANISM	5				
TAKE-UP MOTION	25				
LET-OFF MOTION	10				
LAY MOTION	5				
PROTECTION	5				
PICK MOTION	10				
HEAD MOTION	20				
GENERAL	10				
Lubrication	5				
Cleanliness	5				
TOTALS	100				

Reasons for Allowances:

A-slightly worn, B-considerably worn, C-badly worn.

DRIVING MECHANISM	A	B	C	OS
Motor pinion	196	20		8
Drive gear	168	44	4	8
Friction clutch	200	20		4
Crank shaft bearings	68	152		4
Drive-shaft bearings	108	116		
T	740	352	4	24
TAKE-UP MOTION				
Pusher-rod stud	128	88		
Pusher blade	184	20	12	
Ratchet dog	212	8		4
Take-up gears	36	176	12	
Cloth roll				
Cloth-roll covering	64	68	32	4
Cloth-roll gear	4			
Cloth-roll set screws				4
Cloth-roll journal	124	12		32
Sand roll				
Sand-roll covering	56	136	32	8
Sand-roll gear	136	36	16	148
Sand-roll set screw	48			
Sand-roll journal	108	108	8	
Take-up roll				
Take-up-roll covering	80	136	8	
Take-up-roll grip	104	104	16	
Take-up-roll set screw	24	4		196
Take-up-roll journal	64	108	48	4
T	872	1004	184	400
LET-OFF MOTION				
Beam bearings	160	40	4	20
Friction bands	192	16		16
Weight arm connections	196	8		20
Whip roll	200			24
T	748	64	4	80
LAY MOTION				
Pit arms	88	96		
Pit-arm studs	48	136		
Back stay	124	84		16
Reed fastenings	124	88		12
Lay-arm studs	140	84		
Race plate	84	140		
Eccentric gears	132	52	40	
T	740	680	40	28

PROTECTION	A	B	C	OS
Protector-rod fingers	180	40		4
Protector-rod stops	128	84		4
Knockoff levers	60	148	12	4
Shipper-handle studs	112	104		8
T	480	376	12	20
PICK MOTION				
Shuttle boxes	240	176	16	16
Shuttle-box sheaves	92	124		
Shuttle-box studs	104	120		
Shuttle-box filler chain	80	136		
Picker rod	168	20		36
Picker-rod bushing	156	48	20	
Picker shoes (adjustment)	132	60	4	28
Picker bills	268	172		8
Picker-ball studs	272	168	8	
T	1512	1024	48	88
HEAD MOTION				
Bevel gears	96	120		
Cylinder gears	104	100	12	
Cylinder-gear journals	128	88		
Timing gears	144	80		
Timing-gear studs	124	100		
Vibrator gears	92	124		
Vibrators	88	128		
Vibrator shaft	108	108		
Jacks	184	40		
Lock knife	208	16		
Cylinder cam and finger	208	16		
Harness wires	60	156	8	
Harness sheaves	48	172	4	
Harness-sheave shaft	44	180		
	1636	1428	24	
GENERAL				
Tighten cross stays and girts	8		212	4
Breast beam	144	52	16	12
Drive-shaft brackets	120	96		
Floor bolts	8		212	4
Breast plate	124	84	8	8
Back stands	44	164		8
Overhead braces		4	116	
Bridge bolts		8	112	
Lubrication				
Cleanliness				
T	448	408	676	36
GRAND TOTAL	676	536	1436	680

It is necessary first to establish the number of fixer hours of credit which will be given for the various factors discussed. The figures in Table I are based on a mill operating 224 looms with eight fixers.

It then follows that the fixers' hours allowed for any given month are computed by extending the various points by the preceding allowances. Such an example of a completed calculation is illustrated by Table II.

The total bonus hours payable to the entire group of fixers is then distributed to the fixers on the basis of the actual hours they put in at their own individual rate per hour. See Table III.

An analysis of the Loom-Inspection Report gives a picture of how the entire 224 looms were rated as to their condition. As the fixers are responsible for keep-

OUTLINE FOR SETTING UP WEAVE-ROOM INDIRECT HELP

(Drawn up to meet requirements of a specific mill and not generally applicable without modification.)

CHAIN & GEAR MAN

The duties of the crib man shall be:

1. To install harness and shuttle-box chains in looms about to be started.
2. To check up and make all necessary changes to pick gears, or pinions necessary for new warp.
3. To provide warp yarn on bobbins and blue yarn to each loom scheduled to start up.
4. To maintain the blue yarn required at dressers.
5. To keep an adequate stock of necessary repair yarns on hand in the crib at all times.
6. To make up and repair loom chains as needed.
7. To make up beam aprons and loom leaders as required.
8. To keep the tool crib in an orderly condition.
9. To render assistance to the floor crew when not otherwise employed or in emergencies.
10. To keep sufficient oil supply.

FLOOR CLERK

The duties of the floor clerk shall be:

1. To collect and arrange direct weaving data as required by the payroll department.
2. To provide operation schedules to the crib man.
3. To provide operation schedules to the start-up-crew leader.
4. To provide operation schedules to the fixing crew.
5. To provide operation schedules to the waste collector.
6. Assign weavers to looms.
7. Record warp and filling lot numbers by warp numbers.
8. Check warp against weave paper and have errors corrected.
9. Check weave prices.
10. Maintain daily loom report.
11. Schedule night weaving.
12. Miscellaneous duties such as:
    (a) Changing weave and warp papers as directed by office.
    (b) Procuring lunch tickets for overtime workers.
    (c) Answering telephone inquiries, etc.

SET-UP CREW

The work of the set-up crew shall be:

1. Bring warp to loom.
2. Lift warp into loom.
3. Hang harness on harness straps.
4. Place and center reed.
5. Put apron on, place friction bands.
6. Tie warp yarn to apron.
7. Hook up heddle bars.
8. Hook bottom harness straps.
9. Place reed cap, tighten reed (piecing out reed ends).
10. Fasten center of split harness on larger looms.
11. Adjust selvage harness (tie heddle bars).

The *Boss* of the set-up crew shall be responsible for the following items:

1. Leveling harness, tightening straps.
2. Harness to be in working order, separating wires in, if necessary.
3. Notify loomfixer of completed work.

Loom dismantling—The set-up crew shall be responsible for the following items:

1. Remove reed and place in proper rack.
2. Unhook and remove harness, hang in proper place.
3. Remove beam and place out of way on floor.

LOOMFIXER

The loomfixer shall be responsible for the following tems connected with warp starting:

1. Condition of reed.
2. Shuttle boxes and shuttles.
3. Checks and binders.
4. Set take-up gear and shove bar.
5. Start cloth, putting ends in and placing temples, also edge cords if necessary.
6. Adjustment for the correct picks/inch.
7. Any mechanical adjustment or repair.
8. Stop motions.
9. Notify the warp starter of completed work.

Notes—

1. The fixer's primary job is to keep the looms running. The loom is to be in running order before taken over by the weaver.
2. Any spare time which the fixer has is to be utilized in reconditioning looms not in use so that breakdown time is decreased.
3. A fixer will be rated by the breakdown time in his section; thus recondition time is time well spent.
4. The fixer is not to do any work neglected by the set-up crew. They are to be brought back to do such work themselves.
5. The loomfixers, while assigned to a section of looms, should not confine themselves entirely to these divisions. The fixers should help each other through rush periods.

WASTE COLLECTOR

1. Weigh waste.
2. Record on weave paper.
3. Sort waste.
4. Bag.

MEASURER

1. Measure goods while weaving.
2. Measure, mark, and cut pieces.
3. Gather pieces at looms, fold and truck to burling operation.

WARP STARTER

The warp starter shall be responsible for the following items:

1. Inspect and approve warp yarn.
2. Inspect and approve filling yarn.
3. Inspect and approve picks/inch.
4. Inspect and approve reed.
5. Inspect and approve inches in reed specified.
6. Inspect and approve take-up ratchet and pinion.
7. Inspect and approve harness and box chains.
8. Inspect and approve selvage.
9. Inspect and approve shuttles.
10. Inspect and approve shedding.
11. Inspect and approve temples.
12. Inspect and approve tension.
13. Inspect and approve harness.
14. Notify clerk when loom is ready to start.
15. Make out inspection report.

Notes—

It is quite important that the warp starter does no work which should have been done by the set-up crew or the fixers.

If the warp starter finds something which has been neglected by either of these crews, they are to be notified and will return to correct it.

INSPECTORS

The weaving inspectors shall be responsible for the following items:

1. Inspect filling yarn.
2. Inspect take-up mechanism.
3. Inspect cloth for warp ends out.
4. Inspect edges of cloth (endless).
5. Inspect cloth top and bottom for floats, skips, kinks, streaks, etc.
6. Inspect picks/inch.
7. Harness hookup, top and bottom.
8. Look for and report any other defect, either mechanical or otherwise.

ing looms free of *C* parts, they are penalized on loom condition for all *C* parts found.

Table IV shows the manner in which the total allowed points, the deductions, and the net points were made in arriving at the total loom-condition credit points shown in the "Schedule of Allowances," Table I.

The total points credit are taken from the Loom-Inspection Report. Inspection of the totals under "Driving Mechanism" of 740 *A* parts, 352 *B*'s, 4 *C*'s, and 24 *O.K.'s* shows the total credits amount to 1,120 points. The four *C*'s at a penalty of 1.5 points per *C* item give a deduction of six loom-condition credit points. Such penalties may be increased or decreased according to conditions found.

It may seem a waste of time, on first thought, to spend 20 to 30 min. on every loom each month, inspecting it. However, where such inspections have been properly conducted, maintenance costs have been reduced by as much as 70% with a decided increase in production. The tangible effects in the way of improved quality that are obtainable can readily be imagined and in certain cases definitely calculated.

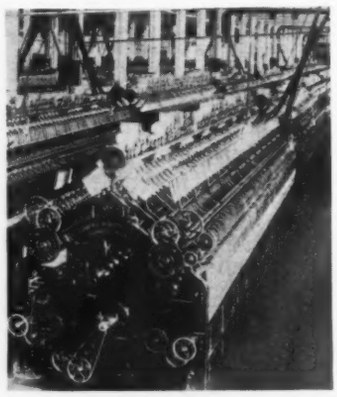
The placement of loomfixers on an incentive of this sort has several distinct advantages. Instead of the fixer being driven, he is doing the driving. A definite measuring stick of his performance increases pride in the rating of his section. There is a distinct financial advantage to himself. The company, on the other hand, saves money and protects its biggest single item of machinery investment.

In order to make sure that all individuals concerned with indirect weave-room work perform their tasks properly and also that skilled labor is not used where unskilled would suffice, a set of standard job instructions should be established, as illustrated. Such a definition increases each man's knowledge of his job, decreases lost time, avoids the usage of high-priced men on manual work, and greatly reduces waiting time on the part of operators.

Good creeling essential if worsted spinner is to avoid

Twitty Yarns

By Frederick B. Hudson



WE may deliver regular and level rovings to the worsted spinner; he may have his machines set to suit the material; but if the creeling is imperfect, twitty and irregular yarns will result. The main cause of defects in creeling is drag. This gives an uneven tension and drafts the sliver into thick and thin places. When these places pass through the drafting rollers, they show up as uneven yarns.

Single-pegged creels usually have iron pegs to support the roving bobbins and employ a small cup at the bottom of the peg to reduce the drag to a minimum. Frequently these cups become surrounded with waste, and excessive tension is placed on the roving sliver as it unwinds from the bobbin. This actually drafts the material and makes weak places in the yarn.

The trouble can be avoided if all the waste is removed from each peg whenever a new roving bobbin is put in the creel. A good opportunity for giving all of the pegs a thorough cleaning occurs when the quality of the rovings is changed. At this time every cup should be lifted and the waste cleaned out from underneath.

In making thick counts, some mills spin their yarns directly from reducer bobbins. When this is done, one must make certain that the pegs of the spinning-frame creel are long enough to support the bigger bobbins. Short pegs which do not reach to the top of the bobbins allow the bobbins to wobble as the slivers unwind. This strains the slivers and drafts the wool into uneven patches.

Skewer creels are advisable for soft-spun yarns. With this arrangement the bobbins are supported at both ends and run more easily. Care should be taken, however, that the skewers are in good working order.

If they receive a slight knock, short skewers tend to fall out of the creels, break down the roving end, and cause soiling of any material which drops on the floor. Skewers which are too long cannot be creeled with ease, and, for that reason, increase the cost of labor for creeling.

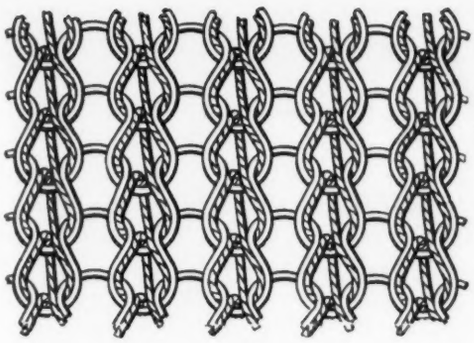
Blunt skewers are the cause of lots of uneven yarns; this is due to the fact that the bobbins move in fits and starts, and the roving sliver is drafted into thick and thin places before it reaches the drafting rollers. On the other hand, skewers with points which are too sharp cause over-running; the end of wool wraps round the skewer base, making entanglements and causing excessive waste.

The steps and cups which support the skewers should receive a periodical inspection. The porcelain cup which carries the skewer may be cracked and, by increasing the drag, may stretch the roving. Cups which have become filled with dirt, grit, oil, and waste also tend to retard the skewers and cause uneven slivers.

Worn points and blunt skewer bases also cause excessive tension. Skewer bases can be re-sharpened so that they again will give satisfactory work if the skewer still has the requisite length. After several sharpenings, however, the skewers are so reduced in size that they tend to fall out of the machines.

Correct alignment of the creels is essential. If the skewers are out of true, uneven tension is placed on the sliver. In addition, the bobbins do not run freely, but tend to wobble and may drop out of the machine. Shaky creels and vibrating machines often cause all the rovings of a spinning frame to fall to the ground. A loose nut may result in an accident of this nature and thus involve a serious loss of time, labor, and output.

New skewers need sorting and testing; any which are warped, blunt, or hooked should be rejected. It is not advisable to place too many new skewers on a machine at one time. Better practice is to take ten working days to renew all the skewers on a 200-spindle frame, installing about twenty skewers a day.



Non-Run Reborn

Warp threads are employed in new Van Raalte full-fashioned hose

Fig. 1. Face of Van Raalte's run-proof fabric

JUST about two years ago the shouting and the tumult over non-run full-fashioned hosiery died down to barely more than a whisper. The dispute between those who controlled the Schwartz patent and those who controlled the Graenz patent proved to have been largely a futile controversy. The consumer was tired of mesh and fancy stitches and wanted to return to staple stockings. Manufacturers abandoned the non-run hosiery in despair—expecting never to see this particular product of the knitter's ingenuity return to prominence again. But the consumer continued to complain about runs in her stockings.

Perhaps it is always folly to assume that any greatly needed improvement will not be accomplished some day by one method or another. The Mills' circular-hosiery texture discussed on page 88 of the November TEXTILE WORLD, for example, is being attempted on full-fashioned machines in England; but an important stumbling block encountered thus far has been, as might be expected, the difficulty in developing a satisfactory double-beard spring needle.

A more important development has recently taken place in this country. Van Raalte Co., New York, has patented a new method and mechanism for producing a stocking which seems likely to give the consumer what she wants—a stocking which won't run but which has the appearance of a normal hose. The Van Raalte non-run hosiery is not on the market—at least under the manufacturer's name—but it is understood that the company is preparing to make an extensive installation of the equipment necessary for producing it.

It is well known that warp-knit fabric will not run. To secure the anti-run property in its new hosiery, Van Raalte knits a warp thread into each wale; but since no warp thread extends from one wale to another, the elasticity of the full-fashioned fabric is not sacrificed. The result is the texture illustrated by Fig. 1, and it will be noted that this resembles closely the Wildt circular-hosiery texture illustrated on page 90 of the November TEXTILE WORLD.

The Van Raalte machine differs little from the usual full-fashioned hosiery machine except that it has a warp-knitting attachment superimposed on it, as shown in Fig. 2, and that the stitch cam is somewhat modified. The guides of the warp-knitting attachment serve to wrap an individual warp thread around each needle after the regular carrier has passed and before the needles dip and press.

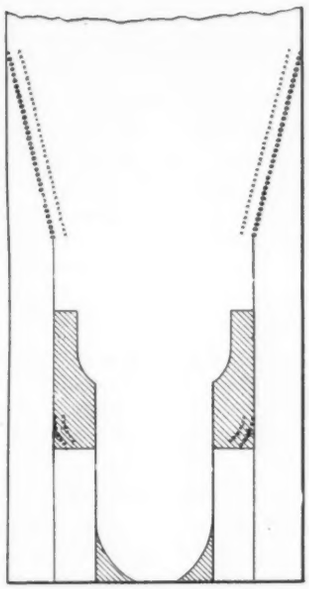


Fig. 3. Leg blank for English foot

The warp loop and the regular loop are pressed off the needles in the same operation. Narrowing is conducted in the usual manner, both loops being transferred simultaneously.

There is one warp beam to a section; and all silk, whether for warp or filling, is treated to be hygroscopic. As fine a stocking as two-thread can be produced by employing a single end in the filling and a single end in the warp. A texture so developed is practically indistinguishable to the naked eye from a normal two-thread texture. It can be made in three-carrier style. The unusual firmness of the non-run fabric renders it resistant to pull threads.

Since it is obviously impossible to transfer the warp threads from a legger to a footer, the stockings are knitted with English foot in order that the in-

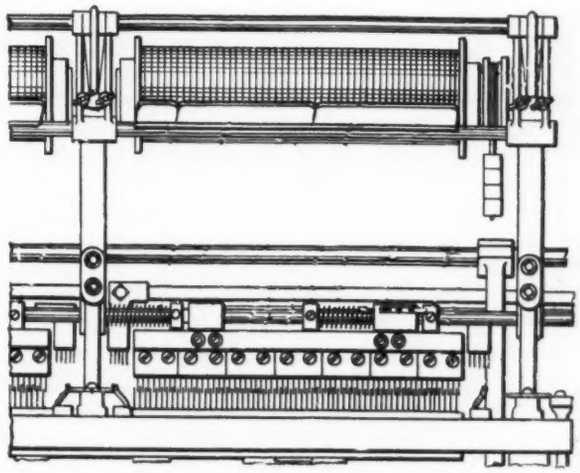


Fig. 2. Warp-knitting attachment

step can be knitted continuously with the leg; but it is conceivable that non-run hose of the French-foot type could be produced on a single-unit machine.

The new stocking was developed by two Van Raalte men—H. V. W. Scott, M. E., manager, and E. E. Carlson, superintendent of hosiery manufacture at the Saratoga plant. Patents in Mr. Scott's name are Nos. 1,978,410 and 1,978,411. Those in Mr. Carlson's name are Nos. 1,978,408, 1,978,409, and 1,978,412. Mr. Scott, who has been with Van Raalte for fifteen years, is well known for his associational activities as a member of the Raw Silk Committee of the National Association of Hosiery Manufacturers, the Code Administration Committee of the Throwing Industry, and the Joint Committee on Classification of Raw Silk. Mr. Carlson came to the company two years ago from Merrill Silk Co.

Test-Tube to Plant...

Textile chemists at annual meeting discuss wide variety of technical subjects

RESULTS of recent research on a variety of textile problems; factors influencing the production of quality rayon fabrics; and improved methods, materials, and equipment employed in processing raw stock, yarns, and fabrics were among the subjects discussed at the fourteenth annual meeting of the American Association of Textile Chemists & Colorists, held Dec. 7 and 8, in New York. Indicative of the important place which research is assuming in the textile industry is the fact that over 50% of the papers presented at the meeting dealt with scientific investigations now being carried out in this country. Some of the more important points brought out by the several speakers at the technical sessions are summarized in the following paragraphs.

A feature of the technical program was the rayon symposium held Friday evening. Following a brief introductory statement by Dr. J. F. X. Harold, consulting chemist, Dr. J. B. Quig, du Pont Rayon Co., called attention to the properties of synthetic yarns which must be taken into consideration if one is to produce high-quality fabrics. He then stated that excessive and non-uniform tension in weaving and knitting, together with the failure properly to control the moisture content of the yarn, are the chief causes of the defects which lead to uneven dyeing. An abstract of Dr. Quig's paper appears on page 64.

Ernest H. Benzing, American Bemberg Co., grouped rayon fabrics into two classes—those which are dyed on the jig or pad, and those dyed on the reel machine. To minimize the danger of warp streaks in fabrics of the latter group, he advocated that goods be dried between scouring and dyeing, and dried on the frame after dyeing. Failure to obtain the desired crepe effect on rayon fabrics can often be traced either to incorrect soaking of the yarn or to improper steaming. Dr. H. D. W. Smith, A. M. Tenney Associates, advocated the installation of temperature recording instruments on dyeing equipment, and the adoption by the knitter, weaver, and finisher of the precision methods employed by the yarn producers.

At the conclusion of the symposium, Leroy C. Steward, Dow Chemical Co., described the commercial production of bromine from sea water, illustrating the process with lantern slides and a moving picture.

Dr. G. M. Kline, U. S. Bureau of Standards, the first speaker at the Saturday morning technical session, pointed out that absorption of moisture by aeronautical textiles is objectionable, inasmuch as it adds to the weight and affects the tautness of the cloth. Fabrics doped with cellulose nitrate are the least hygroscopic, the maximum absorption being less than 12%. Cellulose acetate doped fabrics are similar up to a relative humidity of 97% but at 100% relative humidity take up 35 to 50% of moisture. Gas-cell fabrics with latex-gelatin coatings double in weight at high humidities, and a less hygroscopic material is needed.

Reporting the results of tests to determine the fading of dyeings in radiations of different intensities, Dr. W. D. Appell, U. S. Bureau of Standards, stated that with certain dyes fading is about in proportion to intensity; with others, the rate of fading does not change with the intensity.

Various applications of fluorescence analysis in the textile industry were outlined by A. E. Sampson, Calco Chemical Co. Among the uses suggested are included the following: (1) Examination of cotton to determine mold, degree of boil off or scour; type of starches, waxes, pigments, and preservatives employed in sizing or finishing; and presence of acid, magnesium, and copper; (2) examination of silk to determine fiber quality and type of weighting; (3) examination of wool to determine between mechanical and chemical damage, nature of stains, and percentage of oil present; (4) identification of fibers, dyes, and oils.

Processes in which sodium metaphosphate has proved advantageous were discussed by C. T. Munter, Hall Laboratories, and E. B. Bell, Calgon, Inc. This chemical prevents the formation of calcium and magnesium salts and dissolves these compounds if they are already present. Among the operations cited by Messrs. Munter and Bell in which it has proved of value are included kier boiling of cotton, peroxide bleaching, dyeing of various materials, and scouring of raw wool.

Application of scientific methods to selling of both products and services was advocated by A. R. Thompson, Ciba Co., Inc. Mr. Thompson asserted that an engineering approach to merchandising is needed if the distribution of goods is to approach the efficiency with which they are now produced; the first step in this direction is a better understanding between the buyer and the seller. Summarizing the progress of textile research in southern textile schools, Prof. Charles B. Ordway, Alabama Polytechnic Institute, listed the projects which have been completed recently or are now being carried out. Included in these are studies on trade-waste disposal, staple characteristics of various types of cotton, analysis of bleaching processes, manufacture of rayon wastes into yarn, suitability of slash pine pulp for manufacture of rayon, increasing wet strength of rayon, utilization of sweet potato starch, and investigation of sizing materials.

In an illustrated lecture, Prof. Edward R. Schwarz, Massachusetts Institute of Technology, compared the old and new methods of textile technology. By means of the microscope, polarized light, and fluorescence analysis, one is able to learn much about the external characteristics of textiles. For studying the internal structure of fibers, the x-ray is now the leading weapon. Preparation is now being made for experiments in breaking down the structure of the atom, and there is a possibility that in the future it may be possible to transmute atoms in fibers.

Quantitative analysis of fiber mixtures was discussed in a paper by Dr. R. T. Mease, U. S. Bureau of Standards, which was read by Dr. Appel. In the case of cot-

William R. Moorehouse, Treasurer, A.A.T.C.C.

A. R. Thompson, Jr., vice-president, A.A.T.C.C.

Robert E. Rose, re-elected president, A.A.T.C.C., at annual meeting in New York, Dec. 8.

William H. Cady, vice-president, A.A.T.C.C.

Harold C. Chapin, Secretary, A.A.T.C.C.

ton-wool mixtures, Dr. Mease recommended that the wool, rather than the cotton, be determined directly, the aluminum chloride method giving the most accurate results. When cellulose acetate is present in fiber mixtures, the A.S.T.M. method, with some modifications, is the best which has been found as yet.

Dr. Robert E. Rose, E. I. duPont de Nemours & Co., reported on studies made at high temperature to determine the particle size of dyes and hence some of the dyeing properties. Tests made with two pure dyes—one a level-dyeing color for rayon; and the other a non-level dyeing color—indicate that the level-dyeing color has a small particle size, goes on the fiber at relatively low temperatures, and then at higher temperatures comes off the fiber. The non-level-dyeing color has a large particle size at low temperatures and will not go on the fiber; at high temperatures the particle size becomes smaller and dyeing occurs. These experiments lead to the belief that there is a particle size above which substantive colors will not dye and that there is also a minimum particle size below which they will not dye.

Properties and uses of Inconel, a nickel-chromium-iron alloy, were described by F. L. La Que, International Nickel Co. This alloy, according to Mr. La Que, has a number of specific, but limited applications in the textile industry. Among the more important of these uses are in sulphur dyeing, desulphurization of rayon, dyeing of wool with sensitive acid and chrome-acid colors, dyeing of developed colors, and peroxide bleaching. Use of the incline-plane type of apparatus (see TEXTILE WORLD, May, 1934, p. 100) in textile testing was outlined by David Scott, Henry L. Scott Co. An advantage of this type of apparatus brought out by Mr. Scott, which has not been emphasized previously, is that it permits the correlation of yarn and fabric tests.

Discussing the effect of alkalis on wool, Dr. Milton Harris, A.A.T.C.C. research associate, stated that in all instances of alkali damage the biggest change in the wool is in the sulphur content and distribution. Therefore any treatment should be avoided which will affect the double sulphur linkage in the wool molecule and thus make the wool more susceptible to damage by alkali. Precautions to be taken in the chlorine bleaching process were outlined by W. L. Savell, Mathieson Alkali Works. The speaker advocated the use of sodium hypochlorite solutions containing 1 g.p.l. excess caustic, stating the notion that stability is increased as the excess of caustic is increased is erroneous. He stated also that it is desirable to finish the chlorination at a temperature of 100° F. in order to precipitate any impurities which have been brought into the solution. In the bleaching operation, temperatures above 100° F. are not recommended, although many plants are bleaching at higher temperatures.

Results of recent studies of the surface chemistry of textiles were reported by Prof. H. A. Neville, Lehigh University. These studies have given considerable information as to the adsorption of soaps, alkalis, and acids by cotton, wool, and silk, and should lead to advances in the technic of scouring, dyeing, and other processes. The last speaker on the technical program, B. A. Ryberg, A.A.T.C.C. research associate, reported that wool carbonized with aluminum chloride has a greater affinity for dyes than has uncarbonized wool, variations in concentration between 4 and 10% and variations in the relative humidity in the dryer making little difference in the amount of dye absorbed. Addition of hydrochloric acid to the solution, reduction of drying temperature in the range 160 to 200° F., use of hydrochloric acid for removing the residual aluminum compounds, and increasing the amount of material in the dryer all increase the amount of dye taken up by the wool.

Speakers at the annual banquet included Dr. Charles H. Herty, consulting chemist; Q. Forrest Walker, economist, R. H. Macy & Co.; and Dr. Robert E. Rose, president, and Dr. Louis A. Olney, chairman of research committee, of the association. P. J. Wood, past president, acted as toastmaster. The meeting was held under the auspices of the New York Section, of which Ephraim Freedman is chairman. Henry F. Herrmann, General Dyestuff Corp., was general chairman of the convention committee.

Officers of the association re-elected for the ensuing year are as follows: president, Robert E. Rose; vice-presidents, A. R. Thompson, Jr., and William H. Cady (newly elected); treasurer, William R. Moorehouse; secretary, Harold C. Chapin.

Double Cloths . . .

By R. A. C. Scott

Color-effect capacity extended by interchanging back and face yarns

THE chief benefit of the method of constructing weaves by interchanging the back and face yarns of double cloths lies in its easy adaptation to the production of effects not obtainable in single weaves. Providing the interchanging is at frequent intervals, the elimination of all stitching is possible. The method was employed once in the formation of spots in vesting designs, and was also extensively used in the production of fancy lining effects—interchanging back and center cloths in the three-ply or treble cloth construction—for the heavy overcoatings so popular about eight years ago.

In Fig. 66 an ordinary double two-and-two-twill weave with the stitches omitted is shown arranged one face to one back in warp and filling and repeating on eight ends and picks. In the constructing of warp-interchanging designs, the repeat is made either one end less or one end more, which results in an odd number of ends, necessitating two repeats of the twill to be run in before the repeat of the picks is complete. In this way the odd and even ends form the face and back fabric in one twill, while in the other the positions of the ends are reversed. The picks, however, remain the same—i.e., odd picks on face and even picks on back throughout—and, as in the ordinary type of double cloth, different and inferior quality of backing yarn may be used in the filling.

Fig. 67 illustrates the method of construction employed for all ordinary twill double weaves arranged one face to one back, with solid squares representing the face weave, diagonal marks the back weave, and dots the raisers or lifters. The additional warp float indicated by the cross on each back pick may be in either filling or warp, the latter being preferable in this case, as a sharper face twill is obtained. The flat view to correspond with Fig. 67 (in which the marks represent warp) is given at Fig. 68, the shaded lines indicating the under side of the cloth. As the interchange is so frequent, a firm, solid structure results, eliminating any need for further stitching.

The same weave arranged to interchange in the filling is shown at Fig. 69, where the picks are made an odd number by increasing by one the two twill lines, thereby requiring eighteen ends for one repeat. In this case the backing-warp threads may be of an inferior quality instead of the filling yarn, as in the warp-interchanging method.

In constructing designs of a stripe, block, check, or irregular order, another method, equally as simple and of more frequent use, is employed. Examples of each formation are given at Figs. 70, 71, 72, 73, and 74, respectively. As in previous illustrations, solid marks represent the face, diagonal marks the back, and the dots the lifters or raisers. Whenever the sections exceed eight threads and picks, it is necessary to stitch the two cloths; and at times it is advisable to stitch in smaller sections, as by so doing a more even surface is obtained.

Suggestions for Stripe Designs

The stripe design illustrated at Fig. 70 is built as follows: Section *A* is the 2/2 twill right, *B* is the 2/2 basket, *C* is the 2/2 warp cord, *D* is the 2/2 twill two right and two left, *E* is the 2/2 basket, and *F* is the 2/2 twill left. Each section shows a clean cut in addition to the interchange, which accentuates and makes more definite each sectional stripe. It will be noted that sections *A* and *F* are repeated twice, which necessitates the extra stitching indicated by crosses. In *F* the design runs to the left; but as the back is brought to the face, no change in twill direction will occur. Therefore these two sections will show reverse twills and cut with each other in the cloth.

At Fig. 71 another stripe formation is illustrated, using the 2/2 twill for face and the 2/2 basket for back. Owing to the infrequency of interchanging (24x24), extra stitching has been employed, indicated by crosses. The order of coloring employed here gives quite an effective striped design, the face showing a step diagonal on 2/2 twill colored one dark and one light in warp and filling, whereas the back shows a two-and-two order of

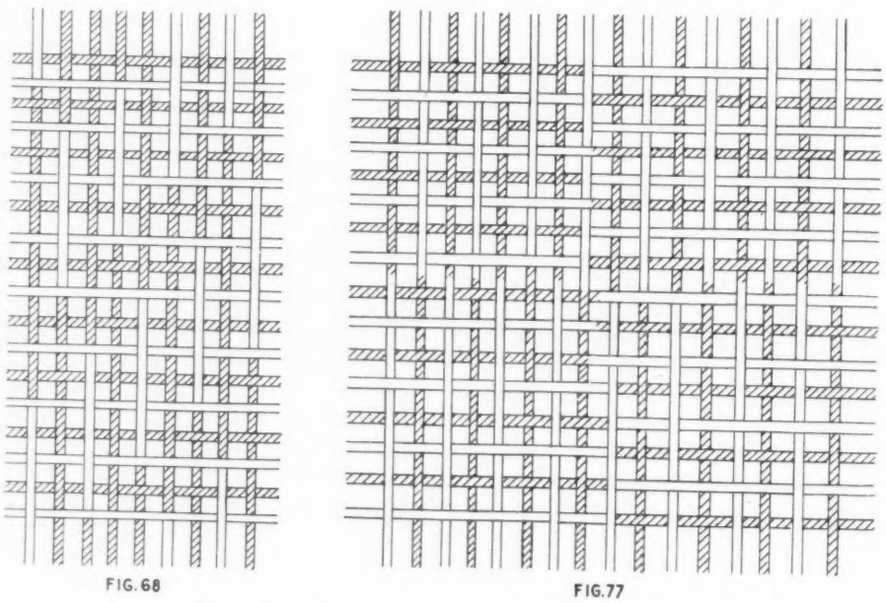


FIG. 68 FIG. 77

Graphic illustration of methods of interchanging back and face yarns

Previous articles of this series by Mr. Scott on backed, double, and treble cloths appeared June, August, and September, 1932; February, May, and October, 1933; and February, 1934.

coloring in stripe formation, each color series being represented at Figs. 71*a* and 71*b*.

A block check arrangement is shown at Fig. 72, where *A* and *C* sections work face up and *B* and *D* sections bring back to face. Each section could be increased in size; but, if this were decided upon, stitching would be absolutely necessary—otherwise a puckered and uneven surface would result. Figs. 70, 71, and 72 are all arranged one face to one back in warp and filling, with marks indicating warp.

Fig. 73 illustrates an irregular formation employing the 3/3 twill for face and 2/2 twill for back, arranged six face to four back and spaced as marked on the design. In this case, one section will show the 3/3 twill, and the interchanging section will show the 2/2 twill, a very useful combination for stripe decoration, etc.

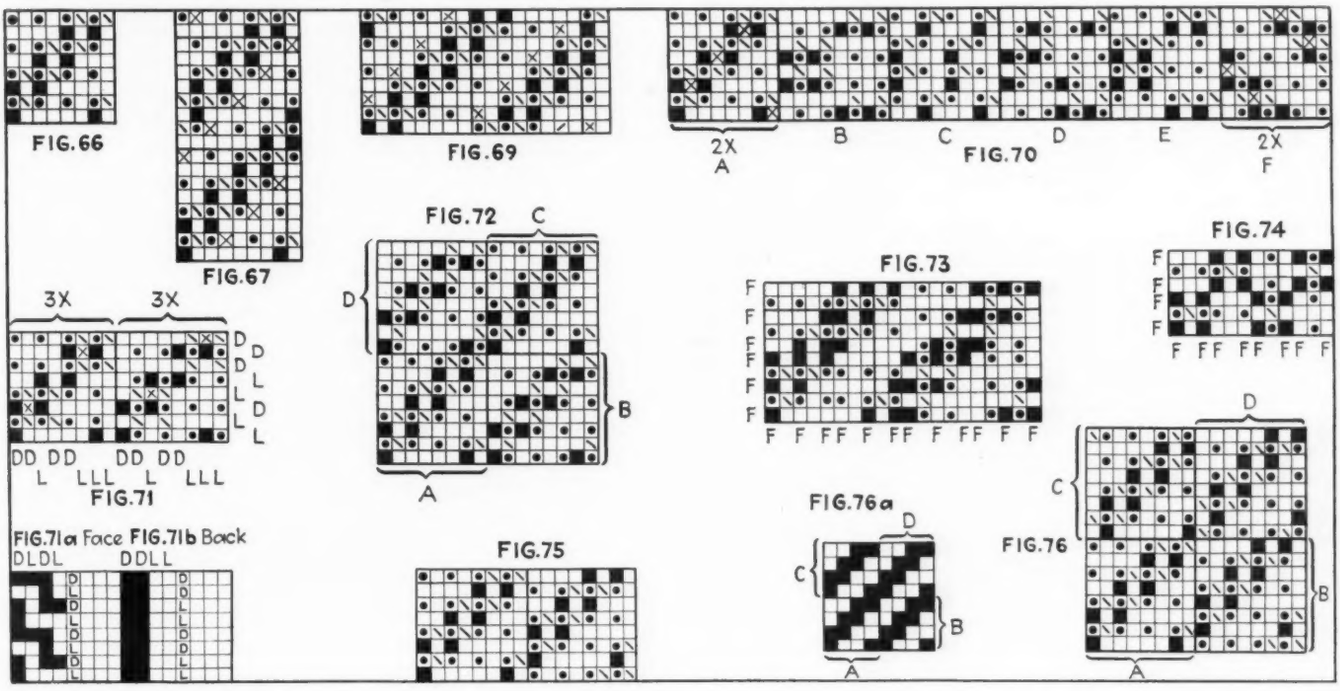
A two-face-to-one-back arrangement is given at Fig. 74, showing the 2/2 basket on face and the plain weave on back.

The method of interchanging filling only, arranged one face to one back, is represented at Fig. 75. The same distinguishing marks are used here as in the previous examples, by following which the system of construction will be readily understood without further explanation. When two contrasting colors are used in the filling—say, light color for face and dark color for back—a distinct double-twill effect will be produced. Various other examples could be demonstrated by way of further illustrating this system of interchanging double cloths, but enough has been said and ample diagrams given to enable the reader to become thoroughly familiar with this subject and its practical utility in the textile field.

Cut double cloths are so called because a division of the face weave is obtained by means of fine, indented lines or cuts on the surface of the cloth. When the lines are near together, stitching on the ordinary principle is not necessary, as the cuts knit the two fabrics together. If, however, the space between the cuts should exceed $\frac{1}{4}$ in., extra stitching places are required in order to avoid forming pockets and too loose a structure. There are two distinct methods of producing cut double cloths: (1) by interchanging the threads, and (2) by interweaving the face and back threads together in three-and-three order.

To produce cut effects by interchanging the threads, the threads are arranged in the proportion of one-face-to-one-back in both warp and filling, the designs resulting from reversing the ends and picks in sections, according to the pattern desired.

Fig. 76*a* shows the positions of the lines for the production of a cut check of equal spaces on the face and back in a double two-and-two twill. The cuts between *A* and *B* and between *C* and *D* are obtained by reversing the picks; and between *A* and *C* and *B* and *D*, by reversing the ends. Therefore each end and pick forms part of both the face and the back cloth, enabling a perfectly regular structure to be obtained employing one warp beam only. The full design is illustrated at Fig. 76, using the same distinguishing marks as before. It will be noted that the two-and-two twill is continuous throughout, the cuts or lines being produced by the interchanging of the threads.



Effect of Colors

Again, by coloring this design one dark and one light in warp and filling, a solid dark surface would be formed in section *A*, while a solid light surface would be formed in section *D*, with sections *B* and *C* giving similar intermingled color effects. The color effect on the under side would be the reverse of the face in the solid portions; i.e., *A* and *D*. The flat view to correspond with Fig. 76 is given at Fig. 77.

As a general guide, it may be helpful to formulate the direction of cuts as follows: Interchanging filling threads produce a cut lengthways, while interchanging warp threads produce a cut crossways. Cloths employing cut check weaves on the order of Fig. 76 are generally woven white and piece-dyed, as both face- and back-weave and yarns assist in forming the face effect.

[In the next installment of this series, to appear in an early issue, Mr. Scott will describe cut effects produced by interchanging or interweaving the threads in three-and-three order.]

Seamless Hints

Based on 30 years' knitting experience

By G. E. Stevens

THE correct winding of yarn is a vital matter in the manufacture of all kinds of hosiery. Skill and constant attention are required to keep the winders in proper condition in order that the yarn will run on and off the bobbins with the least waste.

If bottle bobbins are used, those for legs and footing should not be over 13 in. high. When taller ones are used, the yarn drags on the spindle as it is running off the last part of the bobbin, causing a tension which shortens the stitch and produces variation in the fabric. If the overseer finds that the bobbins vary in size, he should have them sorted out. Those that are alike should be marked with a little spot of paint at the top of the spindle and always used on a winder that is adjusted for them.

If good, even knitting is to be produced with a minimum of waste, it is absolutely necessary that the movable parts of the winder be securely fastened so they cannot move unless they are first loosened. In starting the yarn on the bobbin, let the bobbin turn, holding the end of the yarn where the cone meets the spindle until five or six turns of yarn have covered the end solidly, so that the yarn will run off the bobbin without waste. If starting is always conducted in this manner, the knitter will be able to turn the last few revolutions by hand without waste. It is a common sight to see knitters pulling off yarn from the bobbin, as they are afraid to trust to running it off by power.

The writer believes that the best knot is the weaver's knot, if it is tied in the following way: Place the two ends, crossed, between the left-hand thumb and finger, with the ends projecting about $\frac{3}{8}$ in. Straighten out the fuzz on the ends of the yarn—taking considerable care until used to the operation. The knot can then be tied quicker than any other kind that the writer has ever seen. Wind the yarn around the thumb and finger of the left hand as in the regular weaver's knot, allow just the fuzz to enter the knot, draw the yarn tight around the fuzz, and then roll the knot held between the left-hand thumb and finger before letting go of it. The knot so tied will pass through the hook of a 70-gage needle, latch shut, without cutting a hole.

Allow the knot to go on about midway of the bobbin. If near the spindle, the yarn, in running off, is liable to hook on to it and cause a run-off. Yarn must run off the bobbin freely without the slightest drag, or there will be a variation in the stitch. Sometimes a tension is wanted on the yarn; then the pressure on it must be steady. Specially prepared disk tensions are, by far, the best.

Every mill should have an air-compressor for cleaning machines—one that will maintain 100 lb. pressure if it is needed, according to the number of machines to be cleaned. Instead of continually changing the stitch, keep the machines clean and the stitch will not change. An ideal arrangement for a large mill would be to have an exhaust-pipe system take care of the flyings. There is no other way to take care of them so cheaply and thoroughly.

The writer believes the most satisfactory way to arrange the machinery in a knitting room is to build a top-hand's bench (about a foot wide if transfer work is to be done) under windows, so that the light will shine directly on the loose course. There should be a shaded electric light between the eyes and tranfer to be used if needed. The footing machines around the room should be in lines facing the top-hand's benches, with the shafting on the floor under the machines. The alleyway for the knitter to operate the machines should be so arranged that he will stand with his back to the light. Light racks of wood, on which the finished work may be laid, should be located between the machines. This would leave the rest of the room to the ribbers and winders. Seamers should have the best light possible, the girls sitting back to and as near the windows as can be arranged, with shaded electric lights over the machines. An alleyway should be located between the windows and seamers.

Another way to arrange the knitting machines is to start from the wall at the side of the room and allow two lines of machines of ten in a line, facing each other, with top-hands' benches in the center of the alley where light from the windows will shine down on them. Machines making women's and misses' plain-work and automatic-transfer stockings are arranged this way, with a narrower alley, in order that the knitter may reach a machine on both sides at the same time while standing in the center of the alley.

If the mill is running on transfer work, it is absolutely necessary to have a good loose course in the stockings—one that satisfies the top-hands, within reason, so that a girl will do all she can. A suitable course increases production, and better work is turned out.

If the stitches roll off when the loose course is made, use longer-hooked needles to keep them on. Any needle shop will furnish them. Most all ribbed machines have a device that lifts the dial needles at the same time the cylinder needles are drawn down to make the loose course as large as is wanted without cutting a hole. If holes occur, the trouble may be easily eliminated by adjusting both loose-course devices, dividing the strain.

The wheels of the markers used to measure the lengths of the stocking legs or tops made on ribbed machines (such markers are placed against the webbing on the back side) should be made of iron and should be the same in diameter within one or two thousandths of an inch. The card clothing on the markers should be exactly the same from the inside of the leather that holds the wire to the extreme points of the wire, so that when the wire is on the wheels and laid down flat on a bench, calipers will show a constant reading.

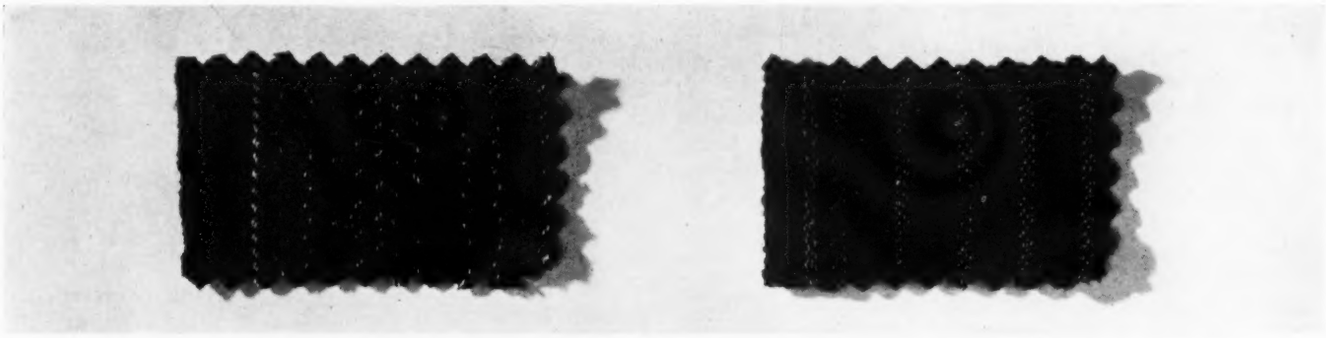
When Stripes Predominate

Finishing of men's-wear suitings requires more than usual precautions

By G. L. Atkinson

PIECE-DYED suitings with a preponderance of striping to introduce more color into the rather somber fabrics usually employed for men's wear are again becoming popular abroad, and it is quite possible that there will be an increased demand for these materials in this country. In the samples illustrated, which are now being produced in England, the stripes consist of white and dyed cotton yarns. Due to the rather large amount of striping, these goods naturally have a somewhat harsh feel, which can be avoided only by extreme care in finishing. Here the tendency is to use silk and rayon in place of cotton in high-grade fabrics of this type, the resulting appearance being more pleasing to the American eye. Whatever material is employed for the stripes, the routine necessary to obtain a satisfactory finish is much the same.

As suitings of this type have to be finished to a definite weight, the first step is to weigh and measure the goods by hand on a 5- or 10-yd. table and mark the back of the pieces with chalk. For this purpose, it is important to employ a chalk which will be completely removed during the scouring operation. Since these fabrics are not likely to crimp, cockle, or develop set marks, crabbing is not necessary.



Test Before Scouring

Before the goods are scoured, samples should be tested in the laboratory to make certain that there is no bleeding of the colored yarns. Considerable experimenting may be necessary in order to find the best procedure. The goods can usually be run in rope form, a machine equipped with a wooden top roll and composition lower roll being suitable.

In order to minimize the likelihood of bleeding of the dye and matting of the fabric, the temperature should be kept at as low a point as is consistent with thorough scouring. Towards the end of the scouring operation care should be taken to prevent excessive "cover," as a clear-cut finish is required and the fabrics will be subjected to further wet processing during dyeing. Addition of ammonia to the scouring bath often proves beneficial. The following procedure, which can be modified to suit local conditions, has been found satisfactory by the writer:

1. Wet out for 10 min. in warm water.
2. Scour 35 min. with soap and soda ash.
3. Rinse 10 min. with warm water.
4. Scour 20 min. with soap and ammonia.
5. Rinse 30 to 40 min. with warm water.
6. Rinse with cold water.

During the final stages care should be taken to cool the goods gradually, as sudden cooling may result in an undesirable hand in the finished fabric. Rinsing must be complete in order to remove all of the soap and other chemicals employed in scouring.

After scouring, the pieces are tacked, preferably face to face, and are then ready for dyeing. Tacking or bagging of the goods in this way helps to avoid matting, excessive cover, listing and cloudiness; in addition, it usually gives a cleaner face than is obtained if the goods are not tacked.

Dyes must be carefully selected in order to get shades of the fastness required and, at the same time, to prevent staining of the white or colored stripes. In this operation, again, abrupt cooling of the goods must be guarded against.

Avoid Over-drying

Extracting is carried out in the usual manner, and the fabric is then dried. Use of a dryer equipped with a conditioning chamber at the delivery end is desirable. Whatever type of dryer is employed, precautions must be taken to prevent over-drying.

The pieces are now given two runs, face and back, on a hollow or spring-bed shear, and a final run, face only, on a solid-bed machine. Next the goods are perched, and the pieces which are free from defects are passed on for the subsequent finishing operations. These operations consist of damping, decatizing, steaming, and pressing. It is important that the goods be run off the decatizing machine at steam heat, no cooling being attempted. The writer prefers to give a light or moderate pressing on a hydraulic press if this type of machine is available. However, a careful pressing on a rotary machine is found to remove the harshness often encountered in suitings of the class in question. For that reason, even when the mill has a hydraulic press, it is not unusual to give the pieces a final run on a rotary press. After pressing, the goods are given a very light steaming and are then folded or rolled for delivery.

Until trouble occurs, the cloth-room overseer is

By G. G. Nicholson

The Forgotten Man

◆ *Failing to receive the attention which it merits when everything is moving smoothly, the cloth room is the first place to feel the brunt of criticism when seconds begin to run high. In this article, which was written shortly before the author met with a fatal automobile accident, Mr. Nicholson, who was connected with the Central Falls Mfg. Co., Central Falls, N. C., discusses the ways in which the cloth room and its overseer can contribute to the successful operation of the mill.*

A FEW executives have sensed the importance of the cloth room and have brought it out of its obscurity. They have located it in a prominent place and have clearly defined the duties and responsibilities of its personnel. Usually, however, the cloth room is tucked away in some remote corner of the plant, and is neglected until trouble occurs and seconds begin to pile up; its overseer is the forgotten man of the textile industry. In this article the writer will attempt to show the true position of the cloth room and to point out how it can be made to operate most efficiently.

What, then, are the functions of the cloth room, what are its duties and responsibilities? In the first place, it is the "feeler" for all the production departments. It has the responsibility of saying when to go ahead with the weaving of a warp. Not more than 1 yd. of goods should be woven from any warp until the cloth room has made certain that the throwing, preparatory, and weaving departments have done their work correctly. The examiners in the cloth room are kept sufficiently busy watching for weaving defects, and cannot justly be held accountable for wrong twists, mixed warps, etc. If faults of this nature are to be caught, suitable laboratory facilities and personnel must be available. And it is "extravagant economy" for the management to fail to provide them.

If the cloth room is to do its part correctly, it must have the cooperation of the other departments. The weave shed, for example, must get its new warp swatches to the cloth room as quickly as possible. When defects are reported by the cloth room, the weave room must correct them immediately, report what has been done to remedy the trouble, and forward a second swatch to make certain that conditions are correct before going ahead with the weaving. The cloth room, on its part, must never let up in its endeavor to determine the cause of defects and the ways in which they can be avoided.

We come now to the second and most important function of the cloth room—grading. Upon proper grading hinges the success or failure of the plant. Grading standards are controlled to a certain extent by the market. Graders must be carefully selected and trained. If more cloth-room overseers realized the responsibility which is placed on the shoulders of a grader when he is turned loose on a machine, they would devote more care and time to his training.

One of the worst mistakes which can be made in a cloth room is to let any grader hear the expression from one of his superiors, "We'll take a chance on that piece." Any man who is a good grader has the intelligence, qualifications, and experience to know whether a piece of cloth which he has examined is a first or a second. A superior with a take-a-chance complex, who habitually over-rules a grader when he has classified a piece as a second, shakes the grader's self confidence, hurts his morale, and sooner or later destroys his judgment. Furthermore, the over-ruling of the grader does not change a second into a first, and in the long run it is impossible to get away with shipping seconds as first-quality fabrics. It is better to lose the profit on two or three thousand yards of cloth, than to have one piece rejected by the customer. Most mills expect a small percentage of goods to be rejected, but the chance of a few cents profit and the false pride in entering a low percentage of seconds on a report sheet are not worth the possible loss of a good customer. If a mill cannot improve its quality of goods and keep its percentage of seconds low elsewhere than in the cloth room, something is wrong, and drastic measures are necessary in other departments of the plant.

From the criticism focussed on the cloth room in some plants and on some occasions, it would seem that the goods were actually woven there and that defects had to be corrected there, rather than in the department where they originated. The cloth room overseer has thrown at him such questions as: "What's wrong, are your graders going wild?" "Have you tightened up on your grading?" "Are your graders scared?" The truth is that a grader has no incentive to classify a piece as a second if it is a first—if for no other reason, because it causes him a third more work, time, and trouble. The cloth room is the natural place to approach when anything goes wrong, although it is not the source of the trouble. One's instinct is to place the blame on whatever is most convenient—in this case, the cloth room. The efficient cloth-room overseer will train his graders to be accurate, level-headed, and self-confident. These attributes are needed when seconds are high and unthinking criticism is leveled at cloth-room personnel.

Successful operation of a plant depends to a large extent upon the quality of goods sent out from the cloth room. It is vital, therefore, for the cloth-room overseer to do everything that he can to increase the efficiency of his own department and to gain the cooperation of the other department heads.

On a Single Boiler

Norwich Knitting Co. places responsibility for operation of entire plant

By Waldo Hutchinson

PLACING the responsibility for the running of an entire mill on a single boiler would, ordinarily, not be considered a good plan; but with the modern equipment installed at the Norwich Knitting Co., Norwich, N. Y., no serious trouble has resulted from this practice. Until recently this mill operated on two hand-fired boilers. During the last few years, however, the mill has been enlarged considerably, and the management was confronted with the problem of providing additional steam-generating capacity. In order to provide the maximum boiler capacity in the minimum space, it was decided to install one pulverized-coal-fired boiler. One old hand-fired boiler was left in place for use when the mill is not in operation and for starting-up purposes. While this boiler might carry a small portion of the load in an emergency, it is so inadequate that it cannot be considered as giving reserve capacity.

The new boiler is a Casey-Hedges 400-hp., vertical, four-drum, water-tube unit, equipped with a superheater. Steam is generated at a pressure of 125 lb. with superheat to give a temperature of 480° F. Normally this boiler is operated at about 200% of its rated capacity. Pulverized coal was selected, not only because it would enable the boiler to be operated continuously at high ratings, but also because of the ability of a pulverized-coal system to respond to sudden changes in load.

The arrangement of equipment is extremely simple, the pulverizer being located immediately in front of the boiler with the feeder running horizontally into the furnace. Primary air for combustion is driven by a fan. Underneath the boiler are ducts, open on the back, as well as the front. Air is circulated under the boiler front to cool the firebox and then is passed through the pulverizer, thus drying the coal somewhat. Raw coal is delivered to the pulverizer hopper directly from an overhead storage silo.

Incoming coal is stored in two cement-slab silos, each having about 135-ton capacity, located adjacent to a railroad siding a short distance from the boiler house. A track hopper is provided through which the coal is delivered to a bucket conveyor and carried to the tops of the storage silos. At the boiler house two other cement silos are provided. These are located directly above that half of the boiler room which contains the pulverizing equipment. This permits the coal to flow by gravity through an opening in the bottom of the silo directly to the pulverizer. Coal is transferred by truck from the storage silos to the silos above the boiler room. At the boiler room the truck delivers to a bucket elevator, which elevates the coal to the top of the silos. A horizontal flight conveyor running over the tops of the silos delivers the coal into the silos.

An interesting arrangement is provided to separate coarse coal from the fine, the former being used for hand firing under the old boiler, and the latter being sent to the pulverizer. Just above the opening in the top of the first silo, a number of steel slats are set up on edge so that the fine coal, as it is carried along by the flight conveyor, falls between the slats into the silo. The coarse coal cannot pass between the slats and is carried to the next silo, which is provided with a single large opening. A spout fitted with a mechanical coal meter leads from the bottom of the fine-coal silo to the hopper of the pulverizer.

The pulverizer is equipped with a dual system of drive, a 40-hp. Whiton steam turbine being attached to one end of the driving shaft, and a 25-hp. induction motor to the other end. Normally, the machine is motor driven; but when starting up and when the main engine is not in operation, the turbine is used. When starting up, the turbine receives steam from the small hand-fired boiler. The pulverizer is equipped with a magnetic separator to remove tramp iron in the raw coal. This separator is supplied with direct current by a small d.-c. generator mounted on the frame of the pulverizer and geared to the main shaft.

Since operation of the mill is virtually dependent on a single boiler, every effort has been made to prevent forced shutdown and, at the same time, to obtain high efficiency. Water for boiler operation and process work is obtained from wells. It is pumped by four triplex pumps through a zeolite softener and then into a roof tank. From the roof tank it flows by gravity into an open feed-water heater from which feed pumps deliver it to the boilers.

Steam is supplied to the mill for process work and to a 320-hp. uniflow engine driving a 200-kw., 200-r.p.m. 60-cycle, 220/110-v. generator. This machine, which operates non-condensing, supplies all the electric energy used in the mill. The entire mill is heated by exhaust steam and, in addition, over half of the cloth is dried by exhaust steam.

Instruments provided to check operation include a multiple-pointer draft gage, measuring secondary air pressure, furnace draft and uptake pressure; a boiler meter; a CO_2 recorder; and a flowmeter for measuring the steam supplied to the dyehouse.

Expert advice is necessary in selection of equipment for

By Charles L. Hubbard

Cooling Condensing Water

IN EARLIER articles (TEXTILE WORLD, January and July, 1934) the writer has pointed out the savings in steam which can be made by the installation of cooling and condensing equipment and has discussed the calculations involved in the operation of condensers. We shall now consider the various types of towers and ponds which are most commonly employed for cooling condenser water.

Towers and Ponds

Cooling towers are divided into two general types: (1) natural draft; and (2) forced draft. In the first type the air passes through because of its higher temperature and reduced weight, as in a chimney; in the second type the air is forced or drawn through by fans. There is also a combination natural and forced-draft type which is used in some cases.

Towers usually are constructed of steel and wood, either singly or in combination. In small natural-draft towers wood is used most extensively, while in forced-draft towers of small size steel is employed to a large extent. For large towers of all classes, wood of a type which has a long life under moist conditions is used almost exclusively, Cypress and red wood are suitable.

While it is possible to construct home-made cooling towers, one of the various commercial types is usually more satisfactory. Cooling towers are on the market in all sizes and forms ready for erection.

The general arrangements of the natural- and forced-draft types are shown in Figs. 1 and 2, respectively. In order to secure the maximum amount of cooling and evaporating surface, the water is caused to drip from a distributing device at the top of the tower, spread out in a film over cooling stacks of special construction, and allowed to run to the bottom of the tower. Here it is caught in a basin, from which it is pumped back to the condenser. In well-designed equipment the air and water are brought into contact from 15 to 20 times during their passage through the tower. While there is a tendency for a certain amount of spray to be carried away with the air, this can be avoided almost entirely by suitable design. A well-proportioned natural-draft tower, having a chimney height of 60 ft. or over will cool approximately 2 gal. of water per minute per 1 sq.ft. of sectional area. Some towers will not cool more than 1 gal. per minute; others will cool up to 2.5 gal. per minute.

Good mechanical-draft towers will cool between 4 and 6 gal. of water per minute per 1 sq.ft. of sectional area. The average velocity of air through a well-designed natural-draft tower will not exceed 300 ft. per minute; and should not be over 750 ft. per minute in the case of forced or induced draft.

Cooling or spray ponds are suitable only in those places where ground space is cheap. At the present time the older form, or natural cooling pond, is rarely used. This is due to the excessive surface area required to produce the desired effect. The required area approximates 150 sq.ft. per horsepower for an engine of good type and aver-

age size. With the newer forms, the water is sprayed over the surface of the pond under a suitable pressure, and the effectiveness of a given area is increased from 8 to 10 times. When a pond is used, cooling is effected to a large extent by radiation and convection. For this reason, provided proper steps are taken to prevent drifting of the spray, the loss of water is less than with a tower, where evaporation predominates.

An artificial spray pond consists of a horizontal system of piping and nozzles above a shallow reservoir, usually built of concrete, and of the general form shown in Fig. 3. The depth should be from 2 to 4 ft. It is customary to allow 1 sq.ft. of surface for each 150 to 250 lb. of water to be cooled per hour, the cooling capacity varying somewhat with atmospheric conditions and the season of the year. The size of the plant is also a factor, and the area needed for plants of various sizes can be calculated from the following table:

Lb. Water Cooled Per Hour Per 1 Sq.Ft. of Surface

Size of plant	Lb. water cooled
500 kw.	150
1000 kw.	200
5000 kw.	250

During the spring and fall the final temperature of the water after spraying will average about 8° F. above that of the air, while in hot summer weather the temperature difference will be still less, due to an increase in evaporation. Much depends upon the design and arrangement of the nozzles, and these details should be left to the judgment of engineers who are experienced in this line of work.

Piping System

The piping system should be so designed that the air lanes between the nozzles are wide enough to prevent hot spots over the pond. In addition, nozzles should not be placed nearer than 15 or 20 ft. from the edge of the pond in order to prevent loss from drifting spray. While this distance is usually sufficient for most conditions, there may be times during high winds when the spray will be carried a greater distance. Therefore, if it is necessary to place the pond within 30 ft. of a building, a louvre fence should be provided for the protection of the building.

The water is commonly sprayed under a pressure of 5 to 10 lb. per square inch, and the power required for pumping does not usually exceed 1.5% of the total power generated by the engine or turbine. This compares with the 3% or more required for a forced-draft cooling tower, taking into account both pumps and fans.

The type and capacity of the nozzles used in connection with cooling ponds vary more or less, and these details are important matters to be considered in laying out a system of this kind. Most nozzles, when operating under a given pressure, have a fixed distance at which they should be placed above the surface of the pond, and also horizontally between one another. In this connection, again, the services of an expert are necessary.

Summary

Finally should be summarized two of the points mentioned in the first article of this series. They are as follows:

(1) Installation of cooling and condensing equipment will usually enable a saving in cost of steam generation and, in conjunction with low-pressure turbines, often will enable power output to be practically doubled with existing boilers.

(2) In each case, a comparison of steam savings with increased overhead charges on additional equipment plus the additional cost of supplying condensing water is necessary to determine whether or not the installation is warranted.

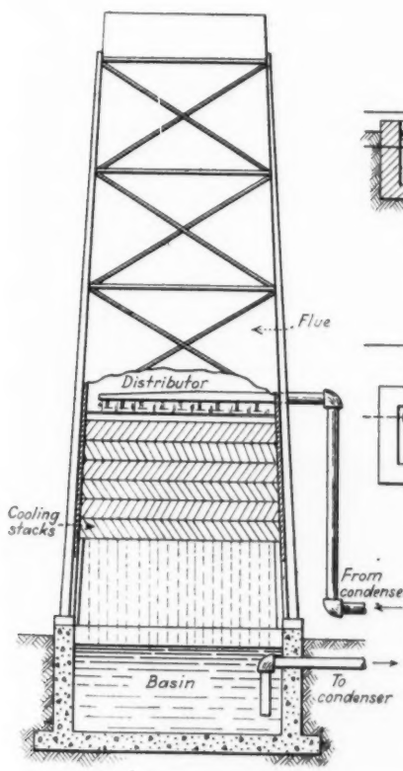


Fig. 1. Natural-draft cooling tower

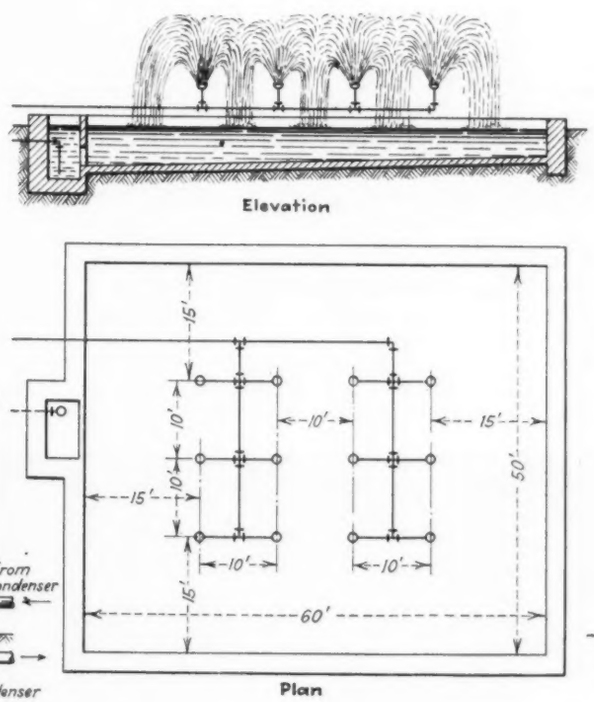


Fig. 3. Cooling pond

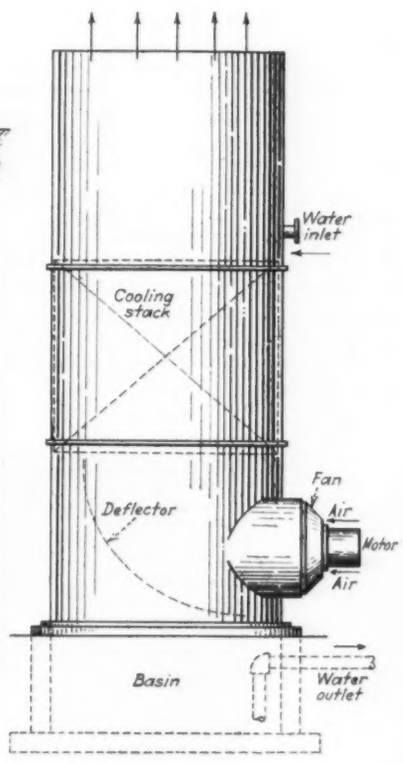


Fig. 2. Forced-draft cooling tower

Bunches in Cotton Yarn

By Charles A. Weston

And a dozen possible causes

I HAVE just examined several samples of ring-spun yarn—ranging in size from 10s to 30s and all spun from double roving—in which there are many thick places. It appears in two of the cases under consideration that the spinning operator has moistened her fingers before piecing up the roving in the creel, this moistening and pinching together of the new and old roving preventing proper drafting. For eliminating this type of imperfection, it is necessary for the overseers, second-hands, and section hands to explain to individual operators the damage which this procedure causes. Posting notices will also help to some extent, if supplemented by proper emphasis daily by the department head.

Two other samples have clearer-waste bunches in them, such waste coming from the top clearer. These bunches can of course be eliminated only by keeping the clearers clean or by picking the clearers before they overload or before the waste falls off. Possibly the clearer cloth is old and the nap worn too much. If the condition of the clearer cloth is to be remedied to some extent while arranging for its replacement, the nap can be brought up with the help of a piece of card clothing.

The other bunches noted in the samples can be caused by many different items and conditions, and in such cases it is well to check the following with a view to their correction:

1. SPRUNG BOTTOM ROLLS on spinning frame, causing an eccentric motion, which in turn causes thick and thin spots in the yarn. Sprung bottom rolls are found in many mills, especially where light weighting is used.

2. LIGHT WEIGHTS being used, especially on coarse yarns or yarns below 15s. Some mills are using 1½- to 2-lb. weights on spinning frames, making 10s to 4s yarn, and are having trouble with uneven drafting. With light weights the rolls must be open more than when heavier weighting is used. When the rolls are opened wider, control over the fibers is not so good, causing uneven work. Long-draft machine manufacturers use in some instances 4-lb. weights on 40s yarn.

3. ROLLS SET TOO OPEN. Possibly two different staples are being run without the settings being altered for each staple. Perhaps uneven staples are being mixed—for example, ⅞-in. cotton with 1 1/16-in. cotton—or sliver, roving, and scavenger waste from the different-staple cottons are being mixed together for a certain yarn. Practically every bale of cotton has 70 to 85% of its fibers less than the staple pulled. Rolls should be set as close as possible. Heavier weighting may allow closer settings; but trouble from sprung rolls, worn roll necks, and worn flutes cannot be overcome by weighting.

4. ROLLS NOT OILED PROPERLY, especially top rolls. Roll speed may possibly be high and necessitate the use of more oil. In that case it is desirable to oil more often, but not to apply a large amount of oil at one time. If the wicks are missing in the saddles, they should be replaced. Using a slightly heavier oil in the summer months may be of some assistance.

5. UNEVEN LEVERAGE. This will cause considerable uneven yarn, providing the weighting is too light. Hanging the weight on the end of the lever, providing all levers are the same length, will of course give the most leverage and weighting on the top rolls.

6. ROVING TRAVERSE. This may be too long, allowing the roving to creep over the ends of the cots and cause thick spots.

7. FANNING OR BLOWING OFF. A few of the samples at hand seem to indicate that flying lint had been spun in. Some cleaning methods actually cause more imperfections than they eliminate, although the trouble is difficult to trace. Most mills having compressed air blow off the spinning machines once a day at least—some mills, twice. They do this on the noon hour when the machines are stopped, and the work is handled by fixers, roving boys, etc. During fanning off, the machines in the vicinity of the blowing should be stopped. One mill with which I am familiar has a boy working in conjunction with the operator at blowing-off time. The boy gets on the opposite side of the machine with a high board covered with old stripping fillet. The flying lint collects to a large extent either near the board or on the fillet. General local conditions regulate this procedure.

8. TWIST IN ROVING on process previous to spinning. Many mills have considerable unevenness in their yarns due to too much twist in the roving. There is a limit to the amount of twist that will permit the roving to be drafted out evenly. This limit is lower than normal when the operator of the roving frame inserts too much additional twist in piecing up a broken roving end.

9. GENERAL. There are three common methods of piecing-up at the spinning frame. (*a*) Run the end over the index finger, near top joint; then touch it to the fibers coming from front roll. (*b*) Hold the yarn between thumb and index finger; then force the yarn by means of the thumb toward the fibers coming from front roll. (*c*) Hold the yarn as in *b* but bring the yarn up to the fibers from front roll with both fingers, having the yarn extend from the fingers slightly; as the yarn comes near the fibers, give it a roll, and it is twisted in. This last method of piecing-up is used in mills making medium and coarse yarns of the better type. When the operator is taught properly, it eliminates bunches.

Tinsel Fabrics

Some interesting constructions, with advice on their efficient production

By Benjamin D. Blackman

THE growing vogue for the luxury fabric may be termed the renaissance of elegance in dress. This demand for richness in fabrics is another step forward on the way to a discerning and well-balanced appreciation of style and taste. The experienced observer has seen this trend advancing with the last few seasons.

In the category of "luxury" fabrics are "tinsels," fabrics embellished by slit-cellulose film, velvets, and the pure-dye classic weaves. The better types of matelassé (reviewed in the March, 1933, and October, 1934, issues of TEXTILE WORLD) may also be considered as among the finer fabrics. The jacquard types of matelassé—and particularly those which allow of cross-dyeing—are still in favor at the moment in the higher price brackets. Although the cutter in the popular-price field goes for the so-called "matelassé" types, the term "matelassé" has come in his vocabulary to mean nothing more than a crepon with dobby effects. Of this corruption of the "matelassé" we have found no parallel, thus far, in the tinsel fabrics.

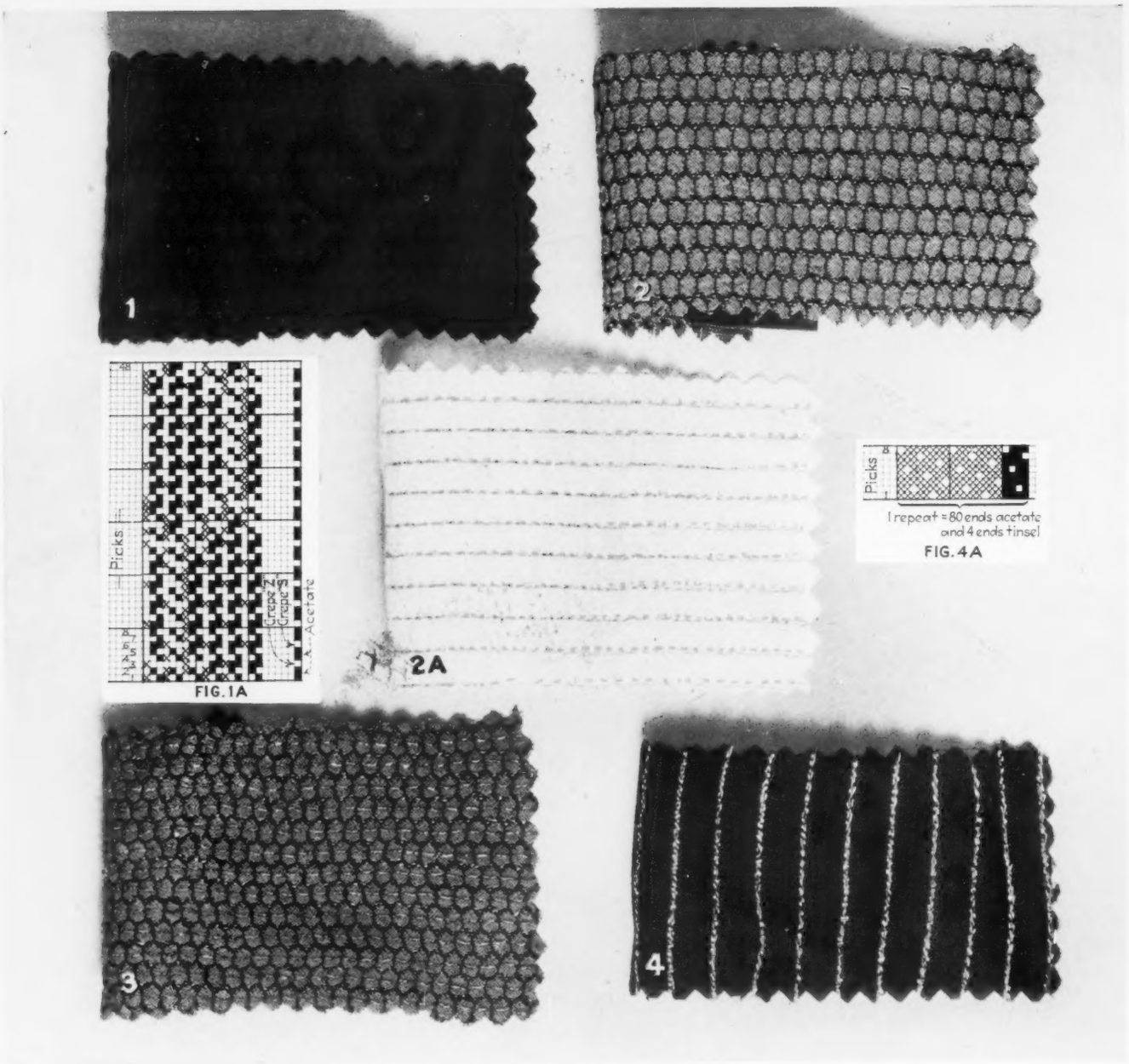
In this article we shall dwell upon the designing and construction of various tinsel fabrics and then go through the mill with them to recommend the best methods for the production of first-quality merchandise.

"Tinsel fabrics" is the name generally applied to cloths made entirely of, or embellished with, gold or silver lamé or laminette. "Laminette" is the term applied to a yarn that has a base of spun silk, silk, or cotton around which the metal is wound. Lamé is the plain strip or thread of metal.

The sizes of laminette generally used for woven fabrics are 17/18s, 20/22s, 25/27s, 30/33s, and 40/45s. These size figures actually represent the thousands of meters per kilogram; for example, 17/18,000 meters per kilogram, 40/45,000 meters per kilogram, etc.

After we have been properly dazzled by the first glimpse of a new tinsel fabric, and have turned it this way and that to feast our innate craving for splendor on the changing glitter, we are likely to find, upon closer examination, that the fabric is a relatively simple one. Tinsel fabrics are frequently combinations of our plain classic weaves with warp or filling stripes, blocks, plaids, circles, dobby effects, or jacquard patterns of laminette or the various nub or slub metal yarns. Sometimes they are dobby- or jacquard-patterned cloths outlined or highlighted with glints of metal. Whatever the general nature of the fabric, the intelligent stylist-designer invariably makes certain that his tinsel creations have a smooth back.

By means of the accompanying illustrations and the following comments, we hope to give the reader an idea of the limitless field which tinsel fabrics open to the



stylist-designer and also to offer practical technical data for the correct fabrication of tinsels.

The wise textile manufacturer avoids the cheap tinsel yarns. He selects those which are free from knots and from those strips where the metal has been shelled from the base.

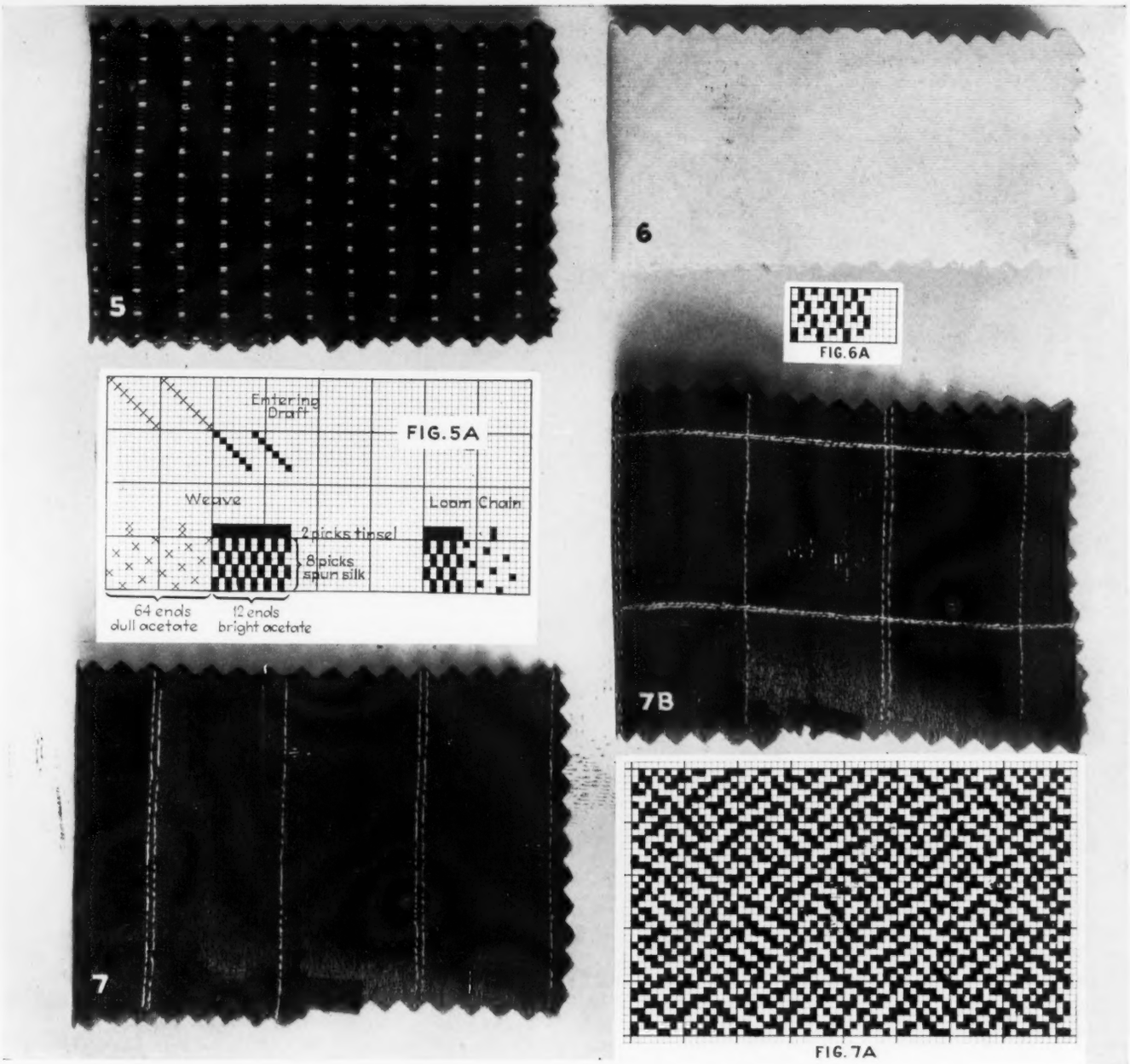
The spools must be handled with care. They are invariably made of the cheaper woods and are easily split or broken. It is advisable to re-draw damaged bobbins. Use them for quills.

By rigging up a coarse weaver's reed to replace the warper's space reed, which is of limited width, it is possible to make the average tinsel warp in one section—that is, when it is the B or C beam. Since we know that knots on a tinsel warp are not conducive to quality in the woven fabric and tend to lessen efficiency of production, it is advisable to rebank the entire creel at the end of the section. Tinsel remaining on bobbins may be quilled.

Instruct the warper to pick the warp in front (as it is running on the frame). This makes for a better warp and eliminates picking when beaming, thus enabling the operator to beam down the warp with stoppage reduced.

Beaming a warp from a horizontal warping wheel is accomplished by attaching the warp by any one of several methods to the beam or roller. Actuation of the latter serves to pull the warp from the wheel. Beaming is therefore an operation that literally pulls a warp from the warping frame. We know that lightly constructed warps must be beamed with little or no weight or drag on the warping wheel. The light warp, if called upon to pull too much weight, will break. Too little drag, however, will cause ends of the warp to sag a trifle when the beamer is stopped. When beaming is re-started, those few ends which are tighter than the others, because they did not sag, will pull first. Naturally, the strain put on these few ends that pull the entire weight will cause them to stretch and break before the remainder of warp straightens out and can assist in the pulling. Some warp constructions are so light that they cannot pull even the weight of the warping wheel.

The simultaneous starting of beamer and warping frame will tend to eliminate the breaking of ends when beaming light warps. A simple method of accomplishing this uniform rolling of beam and warping wheel is to



encircle the wheel and beamer with a strong cord. One extra turn should be put around the beamer.

The average tinsel warp can be put on a whip or cloth roller. Use thin papers and plenty of them.

It is inadvisable to weave tinsel warps with a reed finer than 40 dents per inch. Lack of clearance on the finer reeds tends to shell the metal from the base or core. Where a fine cover of the ground weave has necessitated the use of reeds finer than 40 dents per inch, it has been found that by "kicking out" a dent wire (making a 50-dent reed a 25-dent reed at that spot) tinsel warps will run better and will rarely, if ever, shell. Special reeds for tinsel warps can be ordered from the various reed-makers. The entering department should make certain that the reeds are fixed up and ready for reeding.

On multiple-beam work, the entering department must take care to see that after a reed is stitched, the warps are rolled up straight and evenly; and are tied up in a manner that will prevent rubbing of the tinsel against yarn on other beams. Warp-hangers must be very careful when hanging in these jobs. Much unnecessary work can be caused by carelessness.

Impress the following rule on the quillers: "No knots on tinsel quills." Quills should be made firm, but not too hard. A strict watch should be kept to prevent soft quills. Do not give soft quills to weavers; rather, have the forewoman re-work them at once. Soft quills will raise the waste percentage.

Of course the tinsel warp is the back beam in the loom. Mills using let-off motions will find it more practical to use ropes on the ground beam; as this permits placing the warps closer, saving space and permitting the weaver to handle the job in a more efficient manner. Put very little weight on the tinsel beam.

If electric feelers of the match-stick type are used, contact with the tinsel can be prevented by covering the opening in the shuttle with fur.

If the tinsel shuttle runs out quickly, place it in the top box, where the weaver can keep an eye on it.

The shed should be as low as is consistent with shuttle clearance.

Instruct the weavers to watch knots. If they prove troublesome, by breaking and causing smashes or floats, as they are apt to do, have the weaver run in an end from

a spool until the end on the warp beam is long enough to be drawn in.

Description of Illustrations

The fabric illustrated in Fig. 1 is of outstanding quality. When embellished with tinsel, it becomes one of the finest and most beautiful fabrics ever woven. Warp: 47.5 in. reed width, 40/3/1 reed, 2-thread 13/15 organzine on ground beam and 4-thread 20/22 60/65-turn crepe on second beam, laid 2 ends of 2-thread organzine, 1 end of 4-thread 20/22 "Z" twist, 2 ends of 2-thread organzine, and 1 end of 4-thread 20/22 "S" twist. Filling: 120 picks per inch of 100-den. acetate and 4-thread 20/22 60/65-turn crepe shot 2 picks of acetate, 1 pick of crepe "Z" twist, 2 picks of acetate, and 1 pick of crepe "S" twist. Weave: Fig. 1A.

The fabric in Fig. 1 is shown embellished with tinsel in Fig. 2, after having been subjected to mill boiling-off and dyeing. A gray sample of this material is shown in Fig. 2A. The warp construction is the same as for Fig. 1. The filling is the same plus 30/33s gold shot into picks No. 1 and No. 25 of the weave (Fig. 1A).

The cloth in Fig. 3 is also based on Fig. 1, but has 30/33s gold tinsel shot through picks Nos. 1, 13, 25, and 37 of Fig. 1A.

The construction for Fig. 4 is as follows: Warp, 43.60 in. reed width including edges, reeded 30/4/1 of 75-den. bright acetate and 30/2/1 of 40/45s gold, laid 80 ends of acetate and 4 ends of metal. Filling, 92 picks of 5-thread 13/15 60/65-turn shot 2 "S" and 2 "Z." Weave, Fig. 4A.

Construction for Fig. 5: Warp, 40.30 in. reed width including selvages, reeded 35/8/1 of 75-den. dull acetate and 35/6/1 of 75-den. bright acetate, laid 64 ends dull and 12 ends bright. Filling, 64 picks of 24/3-ply spun silk and 25/27s silver laminette, shot 8 picks of spun silk and 2 picks metal. Weave, Fig. 5A, for weaving face down.

Construction of Fig. 6, which is a moiré tinsel: Warp, 40.60 in. in reed, 60/6/2 reed, 20/22 raw silk. Filling, 96 pick wheel, 24/4-ply spun silk, 30 turns, with 40/45s gold. Weave, Fig. 6A. (Fine metal glint failed to show.)

The fabric in Fig. 7 embodies a sand-crepe ground with warp stripes of 40/45s gold tinsel entered on 2 extra shafts and woven 2 up, 2 down. Weave, Fig. 7A.

In Fig. 7B is shown a tinsel plaid on a rayon sand-crepe ground. The filling tinsel is woven with regular sand weave, Fig. 7A.

Fig. 8 is a handsome metal-effect fine silk sheer georgette with no metal in it. A 200-den. bright rayon yarn dyed fast gold is used on the second beam. A 2-thread 13/15 crepe-twist is used in both warp and filling.

A classic pure-dye fabric, embellished with a gold nub yarn, is shown in Fig. 9. Warp: 55/4/2 reed, 20/22 raw silk, 47.5 in. reed width. Filling: 52 pick wheel; yarn, 10-thread 20/22 (5x2 thd.) 5 and 48 turns, and combination yarn of spun rayon and gold tinsel slub. Weave: 8 picks "S" twist 10-thread crepe taffeta, 1 pick combination yarn 3-and-1 filling float, 8 picks "Z" twist 10-thread crepe taffeta, and 1 pick combination yarn, 3-and-1 filling float.

The fabric in Fig. 10 is a similar construction to Fig. 9, but in a different weave. Fig. 11 is a jacquard.